(21,278.)

SUPREME COURT OF THE UNITED STATES

OCTOBER TERM, 1908.

No. 482.

THE CITY OF COLUMBUS, APPELLANT,

vs.

MERCANTILE TRUST AND DEPOSIT COMPANY OF BALTIMORE, TRUSTEE, AND THE COLUMBUS WATER WORKS COMPANY AND W. S. GREENE, AS RECEIVER THEREOF.

APPEAL FROM THE CIRCUIT COURT OF THE UNITED STATES FOR THE NORTHERN DISTRICT OF GEORGIA.

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1 *Original Bill Filed by Complainants.*

(See next page.)

No. 59. In Equity.

In the Fifth Circuit Court of the United States for the Northern District of Georgia, Western Division.

MERCANTILE TRUST & DEPOSIT COMPANY OF BALTIMORE,
v.
CITY OF COLUMBUS ET AL.

Bill.

Appearances.

For the Complainant: L. F. Garrard, Hall & Wimberly and Joseph Packard.
For Respondents (other than Columbus Water Works Co.): T. T. Miller, W. A. Wimbish and J. H. Martin.

Before Hon. Henry R. Goetchius, Standing Master in Chancery for the Western Division of the Northern District of Georgia, at Columbus, Ga., commencing on February 4, 1904 and ending March 10, 1904.

Geo. C. Palmer, Stenographer.

2 *Original Bill Filed by Complainants.*

Filed July 30th, 1903.

To the Honorable the Judges of the Circuit Court of the United States for the Northern District of Georgia, Western Division:

The Mercantile Trust and Deposit Company of Baltimore, a corporation created by and doing business under the laws of the State of Maryland, and having its office and place of business in the City of Baltimore and State of Maryland, brings this its bill against the City of Columbus, a municipal corporation in the County of Muscogee, State of Georgia, created by and exercising its municipal and corporate functions under the laws of the State of Georgia and againts L. H. Chappell, of Muscogee County, Georgia, and a citizen of the State of Georgia, said L. H. Chappell holding at this time the office of Mayor of said City of Columbus, and against E. P. Dismukes, J. I. Darby, W. C. Lawrence, J. D. McPhail, N. L. Dudley, L. T. Jones, R. Weiland, J. T. Moncrief, J. L. Newman, W. J. Hartman, L. A. Camp, F. M. Sommerkamp, E. J. Wynn, J. H.

McKnight, Max Banner and T. E. Mitchell, all and singular of Muscogee County, Georgia, and citizens of the State of Georgia, and at this time being the aldermen of the City of Columbus, and against the Columbus Water Works Company, a corporation created by and existing under the laws of the State of Georgia and located in Muscogee County, Georgia, and thereupon your orator complains and says:

3

I.

Heretofore, to-wit, on the first day of January, 1891, the said Columbus Water Works Company constituted your orator Trustee for such person or persons or body or bodies politic, as should become the holders of five hundred first mortgage bonds of the Columbus Water Works Company, of one thousand dollars each, amounting in the aggregate to the sum of five hundred thousand dollars, and on said date, mortgaged, conveyed and set over unto your orator as such trustee and its successors, by deed of trust, for the use, benefit and security of said bondholders, and in order to better secure the payment of said bonds and the interest accruing thereon, all and singular the real estate and personal property of the said Columbus Water Works Company, its water works, plant, machinery, reservoirs, pump-houses, standpipes, mains, pipes, hydrants and equipments, and all the rights, easements, privileges and franchises, contracts, choses in action or demands for water supply, and all of its assets, of every kind and description, whether owned by said company at the time of the execution of said deed of trust or thereafter to be acquired; and more especially the contract made between the Columbus Water Works Company and the City of Columbus, hereinafter referred to.

Said bonds are dated the first day of January, 1891, and
4 are payable in the lawful coin of the United States, on the first day of January, 1911, and bear interest from date at the rate of six per cent. per annum, payable on the first days of July and January, in each year. After January 1st, 1895, the interest on said bonds was by agreement reduced to five per cent. per annum. The covenants, and conditions and trusts of the said deed and the powers and duties thereby conferred upon and raised on the part of your orator will fully appear by reference to the said deed. Your orator attaches hereto a copy of said deed and marks the same Exhibit "A" and prays leave of reference to the same, as often as may be necessary. The original deed will be to the court shown.

II.

Said bonds so secured as aforesaid were duly issued and of the same four hundred have been delivered, eight of which are now in the possession of the Receiver, appointed as hereinafter mentioned, of the Columbus Water Works Company, leaving three hundred and ninety-two of the same now outstanding and held by persons who purchased the same in open market for value, and your orator thereby became and is trustee for the holders of said bonds, in accordance with the provisions of said deed.

III.

Said bonds were issued and sold by the Columbus Water Works Company in order to raise the money wherewith to construct, equip and complete a system of water works, for the purpose of carrying out its contract with the City of Columbus in the aforesaid deed referred to.

IV.

The contract made between the City of Columbus and the Columbus Water Works Company, heretofore referred to as having been conveyed by and included in the foregoing deed of trust, was made by said City of Columbus on the 7th day of October, 1881, with one Thomas R. White, of the City of Philadelphia and State of Pennsylvania and such other persons as might be associated with and incorporated with him, it being the intention at that time that a corporation should be organized under the general incorporation laws of the State of Georgia, consisting of the said Thomas R. White, and his associates and assigns, to be styled the Columbus Water Works Company. Such corporation was afterwards duly organized and on the 5th day of April, 1882, the Mayor and Council of the City of Columbus were notified that the Columbus Water Works Company had been fully organized and that said White had transferred his contract to the said company, and thereupon the said City of Columbus ratified said transfer to said company and passed the following resolution:

"Resolved, by the Mayor and Council of the City of Columbus that they hereby ratify and assent to the said transfer and assignment and recognize the Columbus Water Works Company as assuming the obligations and entitled to all the rights, privileges and emoluments arising under said contract."

A copy of said contract is hereto attached, marked Exhibit "B" and is hereby made a part hereof, leave of reference to which is prayed as often as may be necessary. The original will be to the court shown.

V.

The said Columbus Water Works Company proceeded to construct and put in operation a complete and thorough system of water works, in accordance with the specifications and requirements of said contract, and from time to time, by the action of the Mayor and Council, extensions of time were granted to said company for the completion of its contract, as provided by the terms thereof, until on the 6th day of November, 1882, the Mayor and Council of the City of Columbus received notice from B. F. Archer, President of the Columbus Water Works Company, that the work provided for in the contract made between the Mayor and Council and Thomas R. White and subsequently transferred to the Columbus Water Works Company was completed; which said communication, together with the action of council thereon, accepting said work, is hereto attached, marked Exhibit "C," and is hereby made a part hereof, leave of reference to which is prayed as often as may be necessary.

7 VI.

It was provided in article 7 of said contract, that the City of Columbus should pay the Columbus Water Works Company for fifty double fire hydrants, to be placed on the original five miles of street distribution mentioned in said article, and that both hydrants and valves should be of first class workmanship and proper provision should be made to guard against freezing when in use, etc.; which said provisions were carried out and the number of hydrants has from time to time been increased in accordance with said contract, until at the present time, the amount of the annual rental due from the City of Columbus to the Columbus Water Works Company, by the terms of said contract, is the amount of ten thousand two hundred and sixty dollars and ninety four cents ($10,260.94) per annum.

Said contract was made and entered into by the City of Columbus for the purpose of affording an adequate fire protection as well as a supply of water for the use of its inhabitants. The contract was the plan adopted by the City of Columbus, for the purpose of furnishing the City of Columbus and its inhabitants with water works, after a careful and business like investigation, as to how these purposes might be accomplished, in the best and most economical manner.

8 VII.

At the time of the making of said contract and the building of said water works, so great was the anxiety of the people of Columbus, as represented by the Mayor and council thereof, that the said water works should be built, that said Mayor and council did agree and promise by Art. 15 of said contract, that, "in order to make provisions for the payments of water rents, the Mayor and Council, in making appropriations for fire and sanitary departments, shall appropriate a sum sufficient to pay the annual rental of the water works, and the Mayor and council shall receive in payment for any taxes due the city of Columbus the due coupons of any bonds issued by Thomas R. White, to an amount not exceeding the rental due by the city to him, in any one year, and the coupons thus taken, shall be received by him in cash payment of said rentals."

Your orator says that the said agreement on the part of the said city to receive said due coupons for any taxes due to the City of Columbus, constituted an element of credit in the sale of said bonds, which was very valuable thereto, and enabled said water works company to sell said bonds at a better rate than it could otherwise have done, and the same have passed into the hands of innocent holders for their full market value; the said holders taking said bonds and relying on the City of Columbus to faithfully perform its said contract and obligation.

VIII.

9 Your orator further avers that after said work was completed and said contract had been in operation for some years, afterwards, to-wit: in the year 1886, the corporate limits of

the City of Columbus were extended Northward and eastward, taking in a territory of one mile square; that said territory is very hilly and the highest points therein are upwards of ninety feet above the level of Broad Street, thereby rendering impossible an extension into said territory of said water works system without establishing a new system to be operated by pumps, the old system of said company being operated by gravitation; that in compliance with the demand of the Mayor and Council of the City of Columbus, the said Columbus Water Works Company has purchased land in said annexed territory and established a standpipe and laid a large amount of pipe, extending from said standpipe, so that said annexed territory is supplied with water and said upper town system of water works has been connected with the old system in the City of Columbus in such manner that, in case of fire, the pressure is greatly improved and increased; that said improvements were made in a manner satisfactory and acceptable to the Mayor and Council of the City of Columbus.

IX.

It was provided by article 28 of said contract, that Thomas R. White, or the Columbus Water Works Company should obligate itself to extend mains wherever it should be assured of a permanent annual income of seven hundred dollars per mile of pipe,
10 or one hundred and fifty dollars per annum on a line of one thousand feet, or one hundred dollars on a line of six hundred feet. In many portions of the said city, on account of the poverty of the inhabitants, no permanent annual income on the extensions could be assured, yet the water works company has, from time to time, waived this stipulated amount of annual income and extended its mains wherever the City of Columbus has desired fire hydrants, until the lines of said water works company extend over a large area, and include, counting its supply pipes, twenty seven (27) miles, of which 23 miles are located within the limits of the said City of Columbus, on which are placed one hundred and fifty seven (157) fire hydrants.

X.

Your orator shows that said contract was entered into by the City of Columbus with the full knowledge and free consent of the inhabitants composing and constituting said municipal corporation. Public sentiment in favor of said contract was unanimous and it was not submitted to the qualified voters of the City of Columbus, because the same was not deemed necessary; and your orator alleges that the same was not necessary, but that the said Mayor and Council of the City of Columbus were fully authorized to make said contract in all of its terms and to bind the city of Columbus by all of its terms; and your orator alleges that said contract is now a valid, legal and subsisting contract.

11 XI.

Your orator alleges that the Columbus Water Works Company has used all of the income of said corporation, over and above the

sum required to meet the interest on its bonds, in making improvements on said water works system.

During the past year the bridge known as the 14th Street bridge was swept away by an unprecedented flood of water, and the pipes bringing the water of the Columbus Water Works Company into the City of Columbus were swept away; said company immediately placed in service its submerged main under the Chattahoochee River. Later in the night said submerged main broke, by reason of the fall of a heavy stone pier on which said bridge had rested, and for a few hours the supply of water was interrupted, for the first and only time during the continuance of the contract. On ascertaining the facts, the company immediately put into operation its pumping system and supplied the City of Columbus with ample water for fire purposes, and later on entered into an agreement with the Eagle & Phenix Mills whereby all of the fire pumps of said corporation could be used by the said water works company and said company further installed a telephone connection with the office of the Eagle & Phenix Mills, so that the City of Columbus has been absolutely provided against any contingency by which its supply of water could fail.

12 After the sweeping away of said bridge, said company commenced immediately to lay an additional main from Alabama into Columbus, at a very great expense, over the bridge occupied by the Central of Georgia Railway Company, and re-established its connection with its source of supply in Alabama, all of which was done in a remarkably short space of time, and as rapidly as the same could be done by the use of men and money, and its action in doing the same met so far as the water works company was informed or ascertained, the unqualified approval of the citizens of Columbus.

XII.

The Mayor and Council of the City of Columbus, in making said contract, afforded to their constituency ample opportunity to object to carrying out said contract; they did not act hastily or precipitately, but slowly and carefully during more than a year. They investigated different plans and systems, so as to take such action as would, in their judgment, best carry out the purposes in view and secure the benefits and protection of water works for said city. The contract finally entered into by the City of Columbus on the 7th day of October, 1881, was published in full in the daily papers of the City of Columbus; the full contract and every provision thereof was brought within ready reach of every inhabitant of said city. Every citizen, tax payer, and inhabitant accepted the contract as the

13 authorized act of the City of Columbus and the same was acquiesced in by every one and no objection was made or step taken to prevent the carrying out of said contract. In pursuance of said contract, the said Columbus Water Works Company was organized and incorporated under the general incorporation laws of the State of Georgia, for the purpose of complying with and carrying out the provisions of the contract. The application for this charter was duly published in a daily newspaper published in the

City of Columbus, as required by law, and the purpose for which said company was organized was generally known by the inhabitants of the City of Columbus. The incorporators of said company constructed and built a complete and th-rough system of water works in accordance with the specifications and requirements of said contract, and for the purpose of carrying out said contract, said system was finally and fully tested by the city authorities of Columbus and was found to be fully up to the contract requirements and satisfactory in -very particular. From the date of said acceptance, the said company has continued to maintain and operate said system of water works in full compliance with said contract and has furnished to the City of Columbus free and unrestricted use of its water for protection against fire, in accordance with the contract and in -very respect has fulfilled and fully met, observed, kept and performed all of the obligations resting upon it, under and by virtue of said contract. The City of Columbus, has from the date of the
14 acceptance of said work in 1882 continuously until the present, at all times, enjoyed and possessed said fire protection, under and by virtue of said contract, and has used said water for the purpose of extinguishing fire and preventing the spread of conflagration, as often as fires, requiring the services of the fire department have occurred in said city. The inhabitants of said city not only assented and acquiesced in the action of their corporate agents in making said contract, but silently stood by and permitted the Columbus Water Works Company to lay out and expend large sums of money in the purchase of lands, material and machinery, the laying of mains, the erection at different times of two stand pipes and two pumping stations, (one a station operated by steam and the other operated by water power and both of which have been built since the original contract was accepted by the City of Columbus), the extensions of its mains into the part of the city annexed in 1886, and other expenses incident to the installation of a first class water works system, in order to carry out said contract. During the number of months which elapsed from the making of the contract and the completion of the works as originally contemplated in said contract, the large force of hands employed, the excavation of the streets and the laying of the pipes in every part of the City and the large outlay of money expended in erecting said plant, in accordance with the contract, could not fail to have been seen
15 and known by every citizen of Columbus. Since the completion of said contract work, additional work has been done from time to time in the City of Columbus, in which large numbers of hands have been employed, at various times and in various parts of the city, up to the present time. No injunction was applied for, no protests made, by the citizens all assented to the arrangement by which said company, at a cost of more than four hundred thousand dollars, has put itself in a position to carry out every part of the contract. The inhabitants of said city, by their silence and acquiescence, have secured to themselves the benefit of a water supply for themselves and their families and their places of business, as well as fire protection for their property.

XIII.

Your orator shows that it was known and contemplated by said City of Columbus, at the time of entering into said contract, that the money required to build said system of water works was to be raised in whole or in large part by the issue and sale of the bonds of the Columbus Water Works Company and that the rentals which the City of Columbus was to pay would constitute the source from which the bondholders were to be paid the interest on their bonds and from which a fund would be provided toward the ultimate payment of the same, and that said bonds would derive their value from said contract, and that for a considerable period of time the said city would be practically the only customer of the water works
16 company, and in order to render said bonds more desirable the City of Columbus in and by said contract agreed and promised that the due coupons on said bonds should be received by the Mayor and Council in payment of any taxes due the City of Columbus to an amount not exceeding the rental due by the city in any one year; and said bonds were issued and sold *bona fide* to an unsuspecting public without any objection on the part of the City of Columbus, or any inhabitant thereof. By said provisions of said contract, the City of Columbus invited persons to become purchasers of said bonds, upon the faith that the city would keep and perform the obligations contained in said contract.

XIV.

The bonds of said Columbus Water Works Company issued as contemplated by said contract were negotiated and sold upon the faith that the City of Columbus would pay said rental annually, as by said contract it had promised to do. The proceeds of said bonds, amounting to three hundred and ninety-two thousand dollars, were used in the construction of said system of water works.

XV.

Both the original company which furnished the money to construct said water works and the present holders of said bonds who afterwards purchased the same for value, in open market, relied and had a right to rely upon the aforesaid contract of the City of Columbus, and acted upon the faith that the same was a
17 valid and binding obligation, said contract having been entered into by the city authorities by and with the assent of the citizens of said city. Said citizens had acquiesced in and by their conduct ratified the action of their corporate agents in making the contract, if authorization on their part had been necessary.

XVI.

Your orator shows that by virtue of said contract, the said Mayor and Council granted to the Columbus Water Works Company the exclusive privilege of maintaining and operating water works in said city for a period of thirty years, or until such time as they might be purchased by the city, and during such time to rent hydrants from said water company and pay for the same, as in said contract

provided. It was further provided in said contract that the Mayor and Council should have the right, at the end of fifteen years from the completion of said works, to buy the same, with all the rights, franchises and property belonging thereunto, and it is provided in said contract for an arbitration of three disinterested parties to ascertain the value of said works, and that the Mayor and Council shall have the right to decline to purchase the works after said value may have been so declared, upon the payment of the costs of the arbitration; and it is further provided, that in the event of the city not making the purchase, the rights and franchises of the
18 water company shall continue in force until the final purchase of the works by the city, and that the right to purchase shall inure to the city every fifteen years, upon its giving 12 months' previous notice of its intention to purchase.

Your orator says, that under said contract, the Mayor and Council cannot build or operate any water works system, of its own, for its own use, or for the use of others, during the period mentioned in said contract and that said period has not yet elapsed; and that said contract is still in force and is a binding and valid contract, and that said Mayor and Council have no right under the terms of said contract to build or operate a system of water works, which will come in conflict with the rights of the Columbus Water Works Company, of your orator and of the bondholders represented by your orator.

XVII.

Your orator shows that on the 14th day of September, 1902, the City Council of Columbus passed an ordinance ordering an election of the qualified voters of the City of Columbus, to be held on the 4th day of December, 1902, by the terms of which said ordinance the issuance of two hundred and fifty thousand dollars of bonds was provided for; the proceeds of said bonds to be used in building, equipping, owning and operating a system of water works by the City of Columbus, with the avowed purpose, as expressed in said ordinance of furnishing water to private parties, in competition with the Columbus Water Works Company, as well as for the use
19 of the city; and it was further stated in said ordinance that the proceeds to be derived from the operation of said water works by the city would, in the opinion of said council, be more than sufficient to pay the principal and interest on said issue of bonds.

It was further declared in said ordinance that the owning by the city of her own water works would result in a great saving to the city, in the cost of fire protection, sanitation and other purposes. A copy of said ordinance is herewith filed, as part hereof, marked Exhibit "D." Said election was held and the result declared to be in favor of the issuance of said bonds and the said City of Columbus is now threatening and proceeding to sell said bonds and to build said water works as appears from the resolution of its city council passed on May 6, 1903, a copy of which is herewith filed as part hereof marked Exhibit "E."

The Mayor and Finance Committee of said City of Columbus in pursuance of said design to build a system of water works have also prepared and issued circulars inviting bids to be submitted, up to

noon of Saturday, August 8, 1903, for the purchase of $250,000 of the bonds of said city to be issued for the purpose of constructing, owning and operating a system of water works for said city, a copy of which circular is herewith filed as part hereof, Marked Exhibit "F." Said bonds, will when issued, pass into the hands of innocent owners, unless the authorities of said city are restrained by
20 the order of this Honorable Court from so doing.

The said city, by its action above set forth, has utterly repudiated its contract solemnly entered into with the Columbus Water Works Company, and disavowed any liability thereunder, in violation of the rights of your orator, of the Columbus Water Works Company, and of the holders of the first mortgage bonds represented by your orator.

XVIII.

Your orator shows that said contract made by and between the Columbus Water Works Company and the City of Columbus looked to the final purchase of said water works by the city; and the building of the same was supervised by a committee of council and citizens appointed by the Mayor and Council; and the requirements of said city were fully complied with in the building of said water works; and said works were built with the object and intention on the part of said city of purchasing the same, whenever it should be to the interest of the city so to do; and a reasonable and fair construction of said contract will show that the rights and franchises conferred on said company by said contract were to continue until said works should be finally purchased by said City of Columbus, in the manner prescribed in said contract. The right is reserved to the city to purchase said water works and all of its rights, property and franchises at the end of each period of fifteen years on giving to
21 said water company twelve months' previous notice of its intention to purchase the same but the city has made no offer and taken no proceedings for the purchase of the said plant of the Columbus Water Works Company in accordance with the provisions of the contract aforesaid.

All of the improvements on said system made by said company, from time to time, have been made in accordance with the terms of the said contract and in accordance with the demand of said city and under the direction and supervision of the city authorities; yet the said city authorities, disregarding the rights of your orator and of the said water works company and of the holders of the bonds of which your orator is trustee, are now seeking to establish and operate an independent water works system in the City of Columbus, the object of which is to compete with and destroy the water works company, for which your orator is trustee, and to render the same valueless, and to force the same to be operated at a loss by reason of its patronage being destroyed, and to deprive the same of its property without due process of law, by disregarding the contract right of the said Columbus Water Works Company and by pursuing a course which is wholly subversive of the terms of said contract and of the good faith to be required and expected of said City of Columbus.

XIX.

Your orator charges that the purpose of said city in repudiating the contract above referred to is to destroy the value of said
22 water works property, by withdrawing from the company revenues necessary to the existence of the same, and thereby force said company to sell the said plant to the city, at any price the said city may see fit to name. The water works company is willing to sell to said city the said water works plant for what it is fairly and reasonably worth but the City of Columbus is only willing to purchase said water works, for very much less than its cost and very much less than its value, and has totally disregarded the stipulations of its aforesaid contract with the water works company, requiring it to ascertain the value of said water works plant by arbitration. Your orator submits that the conduct on the part of the city in endeavoring to depreciate the property of the water company, by repudiating its contract with said company, is unjust and inequitable.

XX.

Your orator shows that in the month of December, 1902, it was informed by said Columbus Water Works Company that by reason of the constant agitation in favor of a municipal water works plant on the part of the City of Columbus, by the refusal of the City to pay its water rents when due, by the conduct of said city in proceeding to have said bond election and also to obtain permission therefor from the General Assembly of Georgia by an Act passed on the 3rd day of December, 1902, and for other reasons, that the said water works company found itself unable to pay the interest falling
23 due and payable to the bondholders of said company, on January 1st, 1903; for which bondholders your orator is trustee; whereupon your orator filed its bill in this Honorable Court on the 22nd day of December, 1902, which is of file and leave of reference to which is prayed as often as may be necessary and William S. Greene was appointed Receiver of said Columbus Water Works Company, by order of this Honorable Court; that said Greene immediately caused surveys and estimates to be made for perfecting the water works system of said company and furnishing a supply of water to Columbus sufficient for the present and future growth of said city, so as to make available for drinking purposes and for fire purposes, and all purposes for which said water works company has heretofore furnished water, a supply of pure filtered water, amounting to over two millions of gallons of water per day; said William S. Greene has applied to this Honorable Court for permission to issue one hundred and fifty thousand dollars of Receiver's certificates, on which petition, by the order of this Honorable Court, leave was granted to immediately issue the sum of fifty thousand dollars of receiver's certificates, reserving the right to increase the said amount from time to time to the sum of One hundred and fifty thousand dollars; which said sum is amply sufficient to supply said city with all the water for all purposes that it can possibly need.

24

XXI.

Your orator shows that of said water rents the sum of two thousand five hundred dollars is now due and unpaid by said City of Columbus, and the said amount is now unlawfully and illegally withheld by said City of Columbus, and it declines and refuses to pay the same.

XXII.

Your orator shows that the aforesaid threatened wrongs and injuries, about to be committed by the said City of Columbus, will, unless immediately restrained, and prevented, irreparably damage the holders of the bonds of the Columbus Water Works Company whose rights and interest are in the keeping of your orator, as trustee.

The Columbus Water Works Company has no property save and except its water works plant and its aforesaid contract with the City of Columbus. It has no revenues wherewith to meet the payment of its operating expenses, and interest on its bonds, save and except the rental stipulated to be paid by the City of Columbus for the water furnished and to be furnished by said company for fire protection, and the revenue derived from the use of water by private consumers. The latter is to a large extent exhausted in operating expenses, and without the aforesaid rental to be paid by the city, said company would not have sufficient revenue wherewith to pay interest on its bonds, and bondholders would lose their in-
25 terest wholly or in large part. Without sufficient revenue to make said water works self-sustaining said water works plant becomes valueless, save and except as its mains could be dug up, and sent off and sold elsewhere, and its machinery and materials sold or utilized in a dismantled condition, which could not be made to yield a sufficient amount to pay one fourth of said bonds.

Moreover, if said City of Columbus be permitted to erect and operate an opposition system of water works, the present water works company would not be in a position to compete successfully for the patronage of private consumers. The City of Columbus is not large enough to support two systems of water works involving two sets of mains side by side, double pumping stations and standpipes, a double investment, and a double set of operating expenses. One or the other system must necessarily give way; and as the citizens would in their capacity as tax payers *to* compelled to make good all losses that might arise to the water works operated by the municipality, it would of course be to their interest to support that system by their patronage, thus leaving the private company practically without business.

XXIII.

Your orator shows that the bonds of the said water works company are held by numerous private owners; and that it is impracticable for them to take steps for their own protection. Your orator,

therefore, has found it necessary as their trustee, to proceed
26 in their interest, and apply to this honorable court to save the property, which forms their security from irredeemable injury and to protect and enforce the contract which constitutes the chief source from which they can derive interest on their bonds, and provide a fund for the payment of the same, and which gives to said water works property its chief value.

XXIV.

Your orator shows that notwithstanding the validity of the aforesaid contract set forth in Exhibit "B" to this bill, and notwithstanding the facts that said bonds were marketed on the faith of said contract, and said water works were erected at great expense, and that the water works company has complied with the terms and conditions of said contract, yet the General Assembly of the State of Georgia has by its Act of December 3, 1902, aforesaid, and the said City of Columbus has by its ordinances conduct and proceedings attempted to impair the obligation of said contract, thereby greatly diminishing and to a large extent destroying the value of the property of said water works company, which constitutes the security possessed by the bondholders; and said city has deprived the bondholders of the rentals which were to be paid by it under said contract, and said action and threatened action of said city are in fraud and destruction of the rights of said bondholders, and your orator, as their trustee, under said contract with the city, and the pro-
27 tection guaranteed under the Constitution of the United States.

The aforesaid ordinance passed by the said City of Columbus on the 14th day of September, 1902, ordering an election for the purpose of determining whether two thirds of the qualified voters of said city should by their assent authorize said city to issue two hundred and fifty thousand dollars of bonds, for the purpose of building, owning, equipping and operating a system of water works, and the holding of the bond election on December 4, 1902, pursuant to the provisions of said ordinance, and the carrying of said proposition by the requisite two thirds of the qualified voters of said city, and the ordinance or resolution passed by said City of Columbus on the 4th day of December, 1902, whereby the result of said election was declared to be in favor of the issue and sale of bonds for said purposes, as well as the subsequent conduct of said city in giving effect to said ordinances; are each and all attempts on the part of said City of Columbus to impair the obligation of said contract in violation of the Constitution of the United States and the protection thereby guaranteed to private rights.

All of said ordinances, acts, resolutions, proceedings and conduct are an effort and attempt on the part of said city of Columbus to impair the obligations of said contract under color of claim of authority from the Constitution and Laws of the State of Georgia, and particularly of the Act of the General Assembly of Georgia

of December 3rd, 1902, aforesaid, in violation and attempted impairment of the protection guaranteed to said contract under the Constitution of the United States.

The City of Columbus, in further attempted violation of the obligation of said contract, contrary to the provision of the Constitution of the United States that no State shall pass any law impairing the obligation of contracts, under color of the authority given it by its charter to make and adopt all ordinances, by-laws, rules and regulations, necessary or proper for the security, welfare, convenience and interests of said city and its inhabitants, and for preserving the health, morals, peace order, and good government of the same, has adopted the aforesaid ordinances, and is proceeding through its municipal officers and authorities, to carry out the same.

The foregoing ordinances, resolutions, acts, proceedings and conduct of said City of Columbus constitute and are a deprivation of the rights and property of your orator, of the bondholders represented by your orator and of the Columbus Water Works Company, without due process of law, and a denial to them of the equal protection of the laws, contrary to the provisions of the Constitutions of the State of Georgia and of the United States.

All of which wrongs and threatened wrongs are contrary to equity and good conscience, and are irreparable, and can only be relieved against and prevented by the gracious interposition of a Court of Equity.

Your orator shows that the present suit arises under the Constitution and Laws of the United States, and your orator invokes the jurisdiction of the Circuit Court of the United States, in order to set up and enforce the protection guaranteed by the Constitution of the United States to contract rights, and to prevent and defeat the effort of said City of Columbus to impair the obligation of the aforesaid contract and to deprive your orator, the bondholders represented by your orator and the Columbus Water Works Company of their property and rights, without due process of law, and to deny to them the equal protection of the laws.

XXV.

Your orator, for and on behalf of said bondholders, and such other person or persons as may be entitled to its aid, as trustee, brings this its bill *for* of injunction and relief such as may be appropriately afforded by a Court of Equity.

Your orator shows that the acts and wrongs of the said City of Columbus, and its officers, agents and confederates are contrary to equity and good conscience, and tend manifestly and greatly to the damage, injury and utter ruin of the bondholders of the Columbus Water Works Company, and persons having the rights of bondholders, and that your orator, as well as those for whose use and benefit your orator sues as trustee, are utterly without remedy at law, and can only have adequate relief in a Court of Equity.

The acts already done have very greatly injured and very seriously

jeopardized the rights of said bondholders, and unless the aforesaid threatened acts and wrongs are at once restrained and prevented, by the gracious interposition of a Court of Equity, the properties, rights and benefits conveyed and mortgaged by the aforesaid deed of trust or mortgage, will be destroyed, and rendered valueless and the injury thereby sustained will be irreparable. The contract which alone assures to bondholders the payment of interest on their bonds will be wholly lost; the revenues from said water works property will be cut off and destroyed; the Columbus Water Works Company will no longer be able to pay operating expenses, or make needed repairs; the property of said company will be depreciated and will prove wholly insufficient to pay off the aforesaid bonded indebtedness thereon; and bondholders will not only lose the interest, but will also lose a large part of the principal of their debt.

XXVI.

Your orator further shows that the wrongful conduct of the City of Columbus in refusing to pay for said water or to be further bound by the obligation of said contract and in destroying without compensation the property, values and rights dependent upon the exclusive franchises, rentals and revenues guaranteed by said contract, and the wrongful threatened conduct of the city in proceed-
31 ing to erect and operate a rival system of water works for fire protection and for supplying the inhabitants with water, in violation of said contract, is an attempt at, and, unless restrained and prevented, will have the effect of depriving the bondholders of said water works company and your orator, as trustee, as well as said water works company, of their property, without due process of law, contrary to the protection guaranteed by the Constitution of the United States. Your orator avers that the said city is not permitted by the Constitution of the United States to thus legislate said water works company and the holders of its bonds and their trustee out of their vested contract and property rights, without compensation.

Wherefore, your orator, suing as trustee, humbly prays:

First. That the writ of injunction may be issued, directed to the City of Columbus, its Mayor and Board of Aldermen, their officers, agents, confederates and abettors, restraining them or either of them, from erecting, constructing, installing, operating (or planning or proceeding so to do) any system of water works, in or for the City of Columbus, or for furnishing the citizens or inhabitants of said city with water, for domestic, sanitary or other purposes, or from entering into any contract or arrangement with any person, firm or corporation (other than the existing contract with the
32 Columbus Water Works Company) for the construction, lease, operation or use of any system of water works, or for the supply of water for fire protection, or other municipal purposes, or from laying mains or other water works, or water pipes, or permitting the laying of pipes, mains or the construction of water works, in violation of the aforesaid contract or the exclusive rights given thereby; or from selling or offering for sale, or disposing of any bonds of the City of Columbus hereinbefore mentioned and described, or from paying out any monies for water works or from

incurring any obligation for water works, or from entering upon or carrying out any contract for water works (save and except the aforesaid contract between the City of Columbus and the Columbus Water Works Company), or from refusing to carry out or forbidding or preventing any person, organization, fire company, or agency from carrying out the aforesaid contract with the Columbus Water Works Company; or from placing any obstacle in the way of the due carrying out and performance and fulfillment thereof, according to its terms, or from ordering, directing, ordaining or by corporate act or ordinance or otherwise, causing, advising, counselling or procuring the fire department, fire companies or other fire organization or individuals, acting as a fire department or company, or using the city fire apparatus, to desist or refrain from the use of water furnished by the Columbus Water Works Company; or from doing any other act or acts in violation of the covenants, stipulations, terms and condition of said contract.

33 Second. That the court grant a temporary restraining order restraining the several things in the preceding prayer mentioned, until a hearing can be had; and that on the preliminary hearing, a temporary injunction be also granted, restraining said acts until a final decree be had in said cause.

Third. That the aforesaid contract between the City of Columbus and the Columbus Water Works Company be decreed and declared to be a valid and mutually binding contract and obligation upon the said city of Columbus and said Columbus Water Works Company; and that the City of Columbus be decreed and adjudged to be estopped by its conduct from disputing the validity thereof.

Fourth. That said contract be specifically enforced and the said City of Columbus be decreed, compelled and required to specifically perform its contract and perform all the covenants, stipulations and agreements therein contained; and in particular to accept and use said water and annually levy a tax upon the taxable property of said city sufficient to pay for the same; and to pay for the same during the continuance of said contract.

Fifth. That the Columbus Water Works Company may be made a party defendant to this bill, for the purpose of binding it by the judgment and decree that may be rendered in this case, and so that the right and equity of subrogation and all other rights and equities therein set up may be enforced and decreed against the said Columbus Water Works Company and that the said Columbus Water Works Company may be held and decreed, on its part, to

34 specifically perform all of its obligations under said contract.

Sixth. That your Honors may grant unto your orator and to those for whose benefit your orator sues such other and further relief, as to your Honors may seem meet and just in the premises.

Your orator expressly waives discovery and answer under oath from each and all of the defendants herein named.

And may it please your Honors to grant unto your orator not only a writ of injunction conformable to the prayer of this bill, but also a write of subpœna of the United States of America, directed to the city of Columbus, said L. H. Chappell, Mayor of said City, E. P. Dismukes, J. I. Darby, W. C. Lawrence, J. D. McPhail, N. L.

Dudley, L. T. Jones, R. Weiland, J. T. Moncrief, J. L. Newman, W. J. Hartman, L. A. Camp, F. M. Sommerkamp, E. J. Wynn, J. H. McKnight, Max Banner and T. E. Mitchell, constituting the Board of Aldermen of said City of Columbus; and the Columbus Water Works Company, commanding them and each of them, on a day certain to appear and answer this bill of complaint and to abide and perform such order and decree in the premises, as to the court may seem proper and that may be required by the principles of equity and good conscience.

MERCANTILE TRUST & DEPOSIT CO. OF BALTIMORE, *Trustee,*
By JOHN GILL, *President.*

Attest:
J. R. WALKER, *Secretary.*

35 JOSEPH PACKARD, 207 *Calvert St., Baltimore, Md.*
HALL & WIMBERLY, *Macon, Ga.*
LOUIS F. GARRARD, *Columbus, Ga.*
Solicitors for Complainant.

STATE OF MARYLAND,
Baltimore City, To wit:

I hereby certify that on this 1st day of July, 1903, before the undersigned, a Notary Public in and for the State and city aforesaid, personally appeared John Gill, President of the Mercantile Trust and Deposit Company of Baltimore and made oath in due form of law that the facts stated in the foregoing bill are true to the best of his knowledge, information and belief.

Witness my hand and notarial seal, the day and year aforesaid.

THOS. H. FITCHETT,
Notary Public.

36 *Mortgage to Secure Issue of* $500,000. *of Bonds by Columbus Water Works Co.*

EXHIBIT A.

This Indenture, made this First day of January, in the year Eighteen Hundred and Ninety One, between the Columbus Water Works Company of Columbus, Georgia, a corporation duly chartered, organized and existing under the laws of the State of Georgia, party of the first part; and The Mercantile Trust and Deposit Company of Baltimore, a corporation duly chartered, organized and existing under the laws of the State of Maryland, and capable of acting in the capacity of Trustee, by and in pursuance of law; party of the second part:

Whereas, the said party of the first part is authorized under the laws of the State of Georgia and by the terms of its Charter to borrow money for the purpose for which it was incorporated, and for that purpose to execute Bonds and convey its property, privileges and

franchises to secure said Bonds, and to sell, hypothecate or exchange said bonds;

And Whereas, heretofore, to-wit; on the 3rd day of December, 1890, the stockholders of the said Columbus Water Works Company, at a meeting duly called for the purpose of devising means for raising money for its corporate purposes, unanimously adopted the following resolutions:

Whereas, this Company did on the first (1st) day of November, 1888, make and execute a Deed of Trust to secure its issue of $150,000.00 of bonds;

And Whereas, arrangements have been made to secure the release of said Deed of Trust and to cancel said bonds.

37 And Whereas, it is proposed to raise money for the purpose of paying off said bonds, and of making additions and improvements to the Works of this Company and providing for future extensions and improvements thereof.

Resolved that this Company make, execute and deliver its Five Hundred negotiable bonds of One Thousand Dollars each, numbered consecutively from one (1) to number five hundred (500) both inclusive, bearing date January 1, 1891, and to become due and payable January 1, 1911, with interest at six per cent. per annum, payable semi-annually according to forty coupons to be annexed to each of said bonds, principal and interest, to be payable in gold coin of the United States:

Resolved, that said bonds shall be of such form and of such tenor and effect as to the Board of Directors of this Company shall seem best, provided the same shall be in accordance with the terms of these resolutions.

Resolved, that to secure the payment of said five hundred bonds or so many of them as shall at any time be outstanding, without preference or priority, interest and principal, this Company make, execute and deliver to the Mercantile Trust and Deposit Company of Baltimore, a Deed of Trust conveying to it all this Company's property, real and personal, its water works plant, machinery, reservoirs, pump houses, stand pipes mains, pipes, hydrants, and equipments, and all the rights, easements, privileges and franchises,

38 contracts, choses in action or demands for water supplied and all its assets of every kind and description whether owned by this Company at the time of the execution of said Deed of Trust or thereafter to be acquired.

Resolved, that such Deed of Trust shall be in such form and of such tenor and effect and shall contain such covenants, agreements, conditions, stipulations and provisions and shall be executed in such manner as to the Board of Directors of this Company shall seem best, provided that said Deed of Trust, shall be in accordance with the terms of these resolutions.

Resolved, that when said bonds and deed of trust shall have been executed substantially in form, manner, tenor and effect determined upon by the Board of Directors of this Company and delivered, they shall be the bonds and Deed of Trust of this Company and such execution thereof shall be evidence in all Courts and places of the

approval of this Company of the term of said bonds and Deed of Trust and of their due execution by this Company.

Resolved, that the Mercantile Trust and Deposit Company, of Baltimore, be appointed Trustee under all the trusts in connection with said bonds and the Deed of Trust securing the same.

Resolved, that three hundred and twenty-five of said bonds by these Resolutions authorized, being the bonds numbered from
39 one (1) to number three hundred and twenty five (325) both inclusive be sold by the Board of Directors of this Company upon such terms and conditions as to them shall seem best.

Resolved, that one hundred and seventy five of said bonds by these Resolutions authorized, being bonds numbered from Three Hundred and twenty six (326) to number five hundred (500) both inclusive, be deposited with the Mercantile Trust and Deposit Company of Baltimore as Trustee, for the purpose of future sale for the making of enlargements, extensions, improvements and renewals in the future, but none of said one hundred and seventy five bonds shall be delivered or issued or suffered to be outstanding except substantially, in the following manner. When the Board of Directors of this Company shall have determined to make any improvements, enlargements or extensions of its Water Works or plant, at or near the City of Columbus, Georgia, and shall have expended in cash the sum of at least Five Thousand Dollars, and shall present to the said Trustee a statement of such improvements, extensions or additions together with an itemized statement of the cost thereof, verified by certificate of the President and affidavit of the Secretary of this Company, it shall be the duty of the Trustee to deliver to the order of the President and Secretary of this Company, so many of the said one hundred and seventy five bonds then remaining in trust with said Trustee as shall be sufficient, at par, to pay the said disbursement so made on account of such improvements, enlargements or extensions, provided that the said Trustee shall require of
40 this Company a statement of its actual income, expenses and taxes during the six months next preceding the application for such bonds, verified by the oath of the President and Treasurer of this Company, and if it shall appear from said statement that the actual income of the company at the rate of income for the said six months over and above operating expenses, taxes and interest on bonds authorized by these resolutions then already outstanding is sufficient to pay the interest on the additional bonds applied for, it shall be the duty of the said Trustee to issue and deliver the same to the order of the President and Secretary of this Company under seal thereof:

Resolved that said Trustee shall, as often as a semi-annual payment of interest becomes due cut off and cancel the matured coupons attached to all of said bonds so remaining in trust with it, so that none of said bonds shall have any past due coupons thereon.

And Whereas, the Board of Directors of the party of the first part, at a meeting duly held on the 16th day of January, 1891, have resolved that the said Bonds shall be of the form, tenor and effect hereinafter set forth, and shall be sealed by the seal of the party of

the first part and signed as indicated in said form by the President and Secretary of the party of the first part, and with the coupons annexed and certified as hereinafter set forth by the said Trustee, and have adopted these presents as the form of the said Deed
41 of Trust to secure said Bonds.

And Whereas, the said Columbus Water Works Company of Columbus, has made, executed and delivered to the said Trustee its five hundred (500) negotiable bonds for the sum of One Thousand dollars (1000) each of the form, tenor and effect adopted by its Board of Directors, which are as follows, that is to say:

(Form of Bond.)

Total Issue, $500,000.

1891. UNITED STATES OF AMERICA. 1911.

Georgia.

"The Columbus Water Works Company" of Columbus.

"The Columbus Water Works Company of Columbus, Georgia, a corporation duly chartered and organized under the laws of the State of Georgia, acknowledges itself indebted to the bearer in the sum of One thousand Dollars, which it binds itself to pay in gold coin of the United States at the office of the Mercantile Trust and Deposit Company of Baltimore, in the City of Baltimore, on the first day of January, 1911, and binds itself to pay interest thereon in gold coin of the United States on the first days of July and January in each and every year upon the presentation and surrender of the interest coupon hereto attached according to the tenor and terms thereof at the rate of six per centum per annum.

This bond is one of five hundred of similar amount, tenor
42 and date secured by a Deed of Trust of even date herewith to the Mercantile Trust and Deposit Company of Baltimore, when the certificate thereon shall be signed by said Trustee.

In Witness Whereof the said Columbus Water Works Company of Columbus, Georgia, has caused its seal and the signature of the President and Secretary to be affixed hereto, on the first day of January, 1891.

[L. S.]

——— ———,

President of the Columbus Water Works.

——— ———,

Secretary of the Columbus Water Works Company.

And each of said bonds has attached to it forty coupons (with fac-simile of the signature of ——— ——— the Secretary of the party of the first part affixed thereto, which fac-simile is hereby declared to be the true and genuine signature of such Secretary and of the same force, validity and effect as if made with his own hand) for each semi-

annual installment of interest to accrue thereon payable when and as they respectively become due, which coupons are in the following form.

Interest Coupon, $30.00.

The Columbus Water Works Company of Columbus, Georgia, will pay to the bearer Thirty Dollars at the office of the Mercantile Trust and Deposit Company of Baltimore in Baltimore,
43 Maryland, on the — day of —— A. D. —— being six months interest on Mortgage bond number.

—— ——, *Secretary.*

And the better to identify the said bonds as those entitled to the security afforded by this Deed of Trust, each of them has endorsed upon it a certificate to be signed by the party of the second part before said party of the second part shall deliver the same, as follows:

Trustee's Certificate.

The Mercantile Trust and Deposit Company of Baltimore hereby certifices that this Bond is one of the series issued according to the terms of the Deed of Trust securing the same.

(Signed) THE MERCANTILE TRUST AND DEPOSIT COMPANY OF BALTIMORE, *Trustee,*

By —— ——, *President.*

Now therefore, This Indenture Witnesseth, That the said Columbus Water Works Company, party of the first part, in pursuance of and by the authority of law and of the proceedings of the stockholders and Board of Directors of the said Company hereinbefore set forth in order to secure the payment of the principal and
44 interest of the bonds above described without preference or priority and in consideration of the premises and of the sum of five dollars to it in hand paid by the Mercantile Trust and Deposit Company of Baltimore, party of the second part, the said Trustee, the receipt whereof is hereby acknowledged, hath granted, bargained, sold, released, remised, enfeoffed conveyed and confirmed and by these presents doth grant, bargain, sell, remise, enfeoff, convey and confirm unto the said party of the second part its successors and assigns, as such Trustee for the uses and purposes and subject to the trusts, stipulations and conditions hereinafter expressed, all those tracts, or parcels of land described as follows:

First. All that tract or parcel of land lying and being in the County of Lee and State of Alabama, the same being a part of Section 33, Township 18 Range 30, described as follows: Beginning at a point on the South line of said section 33, 80 rods east from the southwest corner of said section, thence north 80 rods, thence east 458 feet, thence south 527 feet and 2 inches, thence east 162 feet and

9 inches, thence south 300 feet, thence west 162 feet and 9 inches, thence south 492 feet 10 inches, thence west 458 feet to original starting point, containing 15 acres of land including a mill site on Holland Creek, with all the water rights and privileges pertaining thereto. Which tract was conveyed by Paul Jones, Jr. and Grace R. Jones, his wife, to The Columbus Water Works Company by deed dated 11th day of April, 1882, and recorded in the office of
45 the Judge of Probate of Lee County, Ala. in Deed Book FF page 292.

Second. All that tract or parcel of land lying and being in the County of Lee and State of Alabama, and described as follows: Beginning at a point designated by a stone post on Section 33, Township 18, Range 30 on the north and south division line between the lands of Mrs. Kesiah Long and The Columbus Water Works Company's land, purchased by Frank McElvy the said starting point being 997 feet 5 inches north 4 degrees west from the intersecting corner of the lands of said Kesiah Long and the Columbus Water Works Company's land; this corner being on the line between Section 4, Township 17 and Range 30; and section 33, Township 18 and Range 30, and running from the above named starting point as follows: North 36 degrees 58 min. west, 147 feet 9 inches; thence north 64 degrees 50 min. west 544 feet; thence north 75 deg. 15 min. west 137 feet; thence north 1 deg. 25 min. east 332 ft.; thence north 37 deg. 10 min. west 298 ft. 5 in.; thence north 25 deg. 40 min. west 202 ft. 3 in. thence north 47 deg. 35 min. west 185 ft. 5 in.; thence south 84 deg. 15 min. west 95 ft. 3 in.; thence south 36 deg. 15 min. west 123 ft. 4 in. thence north 40 deg. 50 min. west 167 ft. 3 in.; thence north 4 deg. west 143 ft.; thence south 52 deg. 30 min. east 34 ft. 3 in.; thence north 86 deg. 30 min. east 89 ft. 6 in.; thence north 84 deg. 55 min. east 158 ft. 4 in.; thence south 86 deg. 30 min. east 88 ft.; thence south 64 deg. 25 min. east 116 ft. 3 in.; thence south 58 deg. 45 min. east 176 ft. 3 in.; thence
46 south 86 deg. east 51 ft.; thence north 47 deg. 15 min. east 231 ft. 3 in. thence north 27 deg. east 130 ft. 8 in.; thence south 16 deg. 30 min. east 160 ft. 8 in.; thence south 18 deg. 25 min. west 136 ft.; thence south 12 deg. 15 min. east 211 ft. 7 in.; thence south 43 deg. 30 min. east 598 ft. 2 in.; thence south 44 deg. 15 min. east 235 ft. 5 in.; thence south 22 deg. 15 min. west 125 ft. 3 in.; thence south 86 deg. west 90 ft.; thence south 4 deg. east 322 ft. 7 in. to place of beginning; said tract or parcel of land containing 16.54 acres of land, being a part of the South half section of sections 33, Township 18, Range 30 in originally Russell now Lee County, State of Alabama. This line was run upon a magnetic variation of 4 deg. Which tract was conveyed by Kesiah Long to the Columbus Water Works Company by deed dated the Ninth day of July, 1883, and recorded in the office of the Judge of Probate of Lee County, Ala.; in Deed Book M. M. page 3554.

(In the above description the Frank McElvy land referred to is the first above described tract McElvy sold to Paul Jones and Paul Jones to the Water Works Company.)

Third. The tract known as the Holland lands or Third purchase, situated in said Lee County below first reservoir, which is described as follows: The same being the whole and entire interest in and to the following described land: Beginning at a point to be designated by a marble post marked C. W. W. Co. on the Township line between Townships No. 17 and No. 18 and on the North line of
47 Section 4, Township 17 and Range 30, Lee County, Alabama; thence running east along said line 2100 feet; thence south 1400 feet; thence west 2100 feet; thence north 1400 feet to the place of beginning; These lines being run upon a magnetic variation of 4 deg. This parcel of land being a part of the north half of section 4, Township 17 and Range 30 in orig*g*inally Russell, now Lee County, Alabama, and containing 67 and 1/2 acres of land, more or less; which tract was conveyed by Hettie Holland to the Columbus Water Works Company by deed dated 3rd day of August, 1883, and recorded in the office of Judge of Probate of Lee County, Alabama, in Deed Book M. M. page 442.

Fourth. The tract known as the Velati Farm, or Fourth purchase, Upper Reservoir, which is described as follows: "The South half of Section 32, Township 17, Range 30, except 45 acres more or less off the northwest corner of said half section formerly belonging to Dr. Urquhart and except 10 acres, more or less, off the southwest corner of said half section; said tract containing 270 acres of land, more or less, lying and being in the County of Lee and State of Alabama; which tract was conveyed by J. F. Holland and F. M. Holland his wife on the 26th day of Jan. 1884, to The Columbus Water Works Company by deed, which deed is recorded in the office of Judge of Probate of Lee County, Ala., in Deed Book O. O. page 267.

Fifth. The tract known as the Thompson Land or Fifth Purchase, Upper Reservoir, which is described as follows: Beginning at a stone post midway the section line between Sections 32 and
48 33 at the Southeast corner of the northeast quarter of Section 32; thence running (Magnetic variation north 2 deg. 45 min. west) along said section line north 2 deg. 45 min. west 170 feet; thence south 87 deg. 15 min. west 190 ft.; thence south 62 deg. 30 min. west 403 ft.; thence *thence* north 87 deg. 15 min. east 565 ft. to place of beginning; being part of the northeast quarter of section 32, Township 18, Range 30, in Lee County, Alabama, and containing one and 47 100 acres of land, which tract was conveyed by Mary A. Threlkeld, G. A. W. Thompson and W. T. Thompson by deed dated the 25th day of April, 1884, to the Columbus Water Works Company. Which deed is recorded in the office of the Judge of Probate of Lee County, Alabama, in deed book O. O. page 121.

Together with all the buildings and improvements thereon or rights, ways, waters or privileges thereto appurtenant.

And also all other real estate now owned by said party of the first part or which may be hereafter acquired during the continuance of the lien of this Deed of Trust, situated in the States of Alabama or Georgia or wheresoever the same may be situated.

And also the water works of said party of the first part with the reservoirs, machinery, plant, equipment and appurtenances, pump

houses, stand pipes and buildings; and all pipes, mains, hydrants and all fixtures and apparatus connected thereto throughout the
49 City of Columbus or in the vicinity thereof or wheresoever the same may be now owned by said party of the first part or which may hereafter be acquired during the continuance of the lien of this deed of Trust.

And also all the personal property, charter rights, privileges or franchises under the laws of the State of Georgia or under the ordinances of the City of Columbus including the franchise of the party of the first part to be a corporation, and all rights of way or privileges in and through the streets, alleys, ways and public squares and over and through any private property in said City of Columbus or in its vicinity or elsewhere to lay mains, or pipes and for the erection of hydrants used or to be used for the purpose of supplying water in Columbus and its vicinity or for any other purpose now owned by the said party of the first part or which may be hereafter acquired by it during the continuance of the lien of this Deed of Trust.

And also all contracts made or to be hereafter made during the continuance of the lien of this Deed of Trust between the said party of the first part and the City of Columbus or any public institution or public officers or commissioners for supplying of water by the said party of the first part.

And also all the water rents, debts, dues, demands, choses in action and all the income whatsoever of the said party of the first part due or to be due or arising from its business of supplying water within the City of Columbus or in its vicinity or elsewhere
50 during the continuance of the lien of this Deed of Trust.

To have and to hold the above described property, premises, rights, privileges, franchises, appurtenances, choses in action, assets, and effects unto the said party of the second part, its successors and assigns in Trust Nevertheless, and subject to the declaration of trust, covenants, conditions, agreements, stipulations and provisions contained in the following clauses.

First Clause. This Deed of Trust is executed to secure the payment (A) of the interest on such of said Five hundred bonds heretofore described as shall be at any time during the continuance of the lien of this Deed of Trust outstanding or negotiated; (B) and of the principal of such of said five hundred bonds as shall be outstanding and negotiated;

According to the agreements contained in said coupons and bonds respectively without preference or priority between different bonds; it being understood that the lien of this Deed of Trust is to secure the payment of all interest due on any of said bonds in full prior to the payment of any principal.

And each of said bonds which may be at any time outstanding and negotiated shall be deemed equally secured by this Deed of Trust and by all conveyances or mortgages supplementary thereto.

And in case of entry and taking possession by the said party of the second part, or in case of a sale by said party of the
51 second part as hereinafter provided or in case of any foreclosure proceedings, or in case of the appointment of any

receiver and in case of the receipt of any moneys by the said party of the second part, or any receiver or officer of Court from any income, debts, dues or demands, collected or received by it, him or them, or from any sale of the property or things or any of them herein mortgaged or conveyed or intended so to be or hereafter conveyed by any assignment, conveyance or mortgage supplementary hereto, the cost and expenses of all kinds of said Trustee in the administration of the Trust, and of foreclosure and sale and of courts, officers, and receivers shall be first paid out of said moneys, and the surplus, if any shall be devoted pro rata—first to pay said interest due and second said principal due and demandable without preference or priority between bonds until the whole thereof is paid, and if there should remain any surplus after paying said interest and principal of said bonds, the same shall be paid over to the party of the first part.

Second Clause. So long as the party of the first part shall observe, do, keep, and perform all and singular the premises, agreements, covenants, conditions, stipulations and provisions, in said bonds and coupons and in this Deed of Trust contained and shall well and truly pay or cause to be paid the interest and principal of the debt evidenced and promised to be paid by said bonds and coupons at the time, in the manner and at the place therein mentioned
52 for payment thereof, it, the said party of the first part, may retain possession of all the rights, franchises, privileges, easements, estate, choses in action, property, real and personal, effects and assets hereinbefore conveyed or intended to be conveyed and may collect and disburse monies arising from any and all debts, choses in action, water rents or income whatsoever arising from its business without let or hindrance from the said party of the second part.

Third Clause. And in case the said party of the first part, shall pay the interest on said bonds as the same becomes due and payable, at the time, in the manner and in the place the same is payable according to the terms of said bonds and coupons and shall well and truly pay the principal of said bonds at the time, in the manner and at the place for the payment thereof according to the terms of said bonds, and shall upon demand pay all the expenses of administering to the trust hereunder, and shall during the continuance of this Deed of Trust observe, do keep and perform all the covenants, conditions and agreements and stipulations herein contained and all things by it to be observed, done, kept, or performed, according to the terms of said bonds and coupons and of this Deed of Trust, then the said party of the second part shall cause this Deed of Trust to be released and discharged (but at the expense of the party of the first part) and all the rights, privileges, franchises, easements, choses in action, property, estates, effects and assets, conveyed by
53 these presents, shall be released from the operation of the same.

Fourth Clause. But should the said party of the first part at any time make any default in the payment of the interest on said bonds or any installment or part of any installment thereof, in the manner,

at the time or at the place when and where said interest or any installment or part thereof, shall be due and payable according to the terms of said coupons and bonds or should the party of the first part make any default or neglect, or refuse, or in any manner fail, to observe, do, keep, or perform, all and singular, each and every, covenant, promise, condition, agreement, stipulation or provision in said bonds or coupons and in this Deed of Trust contained and by the said party of the first part to be observed, done, kept and performed, and in case such, or any such default in paying said interest or such default, neglect, refusal or failure shall extend for the period of six months and a majority in interest of the holders of said bond then outstanding shall in writing request the said party of the second part to make such sale, or should the party of the first part make any default in the payment of the principal of said bonds or any part thereof, in the manner at the time, or at the place when and where said principal shall be due and payable according to the terms of said bonds, then in these events or either of them, it shall be the duty of the said party of the second part, and it is hereby authorized and empowered; unless such default be waived as herein provided,
54 after entry as hereinafter provided, or other entry, or without entry, by its attorneys, agent or agents, to sell and dispose of all and singular the said water works, plant, property real and personal, premises, privileges, franchises, appurtenances, equipments, easements, estate, assets and effects, whether owned by the party of the first part at the date of these presents or acquired thereafter and before the time of the sale provided for in this clause, conveyed or intended to be conveyed by these presents, or by any assignment, conveyance or mortgage supplementary hereto, at public auction to the highest bidder at such time and place in the City of Columbus in the State of Georgia, as it may designate having first given public notice of the time, place and terms of such sale by adverti-ment published not less than once a week for eight consecutive weeks in one or more newspapers published in the City of Columbus and Baltimore, with the right to adjourn such sale or sales from time to time in the discretion of the trustee, giving reasonable notice of such adjournment, and after so adjourning to make the sale at the time and place to which the same may be adjourned and upon a consummation of a sale upon the terms and conditions thereof to make and deliver to the purchaser or purchasers thereof good and sufficient deed or deeds in law for the same in Fee Simple or absolutely which sale made as aforesaid shall be a perpetual bar both at law and in equity against the said party of the first part, and all persons lawfully claiming or to claim the said water works property,
55 real and personal, premises, privileges, franchises, appurtenances, equipments, easements, estate, assets and effects or any part thereof so sold by, from, through or under it. And after deducting from the proceeds of such sales just allowances for all expenses of said sale including attorney's and counsel fees and all other expenses, advances and liabilities which may have been made or incurred by the said trustee in operating said water works or managing the business of the party of the first part, while in posses-

sion thereof and all payments which may have been made by it for taxes and assessments and other proper charges upon the said water works and appurtenances, property and premises, rights, interests and franchises or any part thereof as well as a reasonable compensation for its own services, then to pay and to apply the same as provided in Clause First of these presents.

This provision is cumulative to the ordinary remedy by foreclosure in the Courts and this said Trustee herein or its successor or successors in the trust upon default being made aforesaid in the payment of interest or in the performance of the covenants and conditions herein on the continuance of said default for the period of six months, and upon the written request of the holders of a majority in value of the said bonds then outstanding and unpaid or on default in the payment of the principal of said bonds shall institute proceedings to foreclose this Deed of Trust or mortgage in such man-
56 ner by sale under the power herein given or by suit, as the majority of the said bond holders may direct, and if no direction is given in this behalf, then in such manner as to the said Trustee may seem most expedient.

And in case of such foreclosure or any proceedings therefor the said party of the second part may at the commencement of suit and before any plea, answer or demurrer is filed, apply for the appointment of a receiver of all the rents and profits, debts, dues, demands, and choses in action and the property estate and assets of the party of the first part hereby conveyed or intended to be or which it shall then possess or be entitled to or interested in; and such receiver shall be appointed without any opposition from the said party of the first part, and such receiver shall be vested with all the rights, and privileges, and subject to all the duties and obligations granted to and obligatory upon the said party of the second part in case of entry into possession and as specified in the Seventh Clause of this Deed of Trust. And in case of a sale under the power contained in this clause or in case of a foreclosure the whole principal sum of the indebtedness evidenced by said bonds and coupons both principal and interest shall be due, demandable and payable and such sale or foreclosure shall be to satisfy such whole sum.

Fifth Clause. And it is hereby declared that the receipt or receipts of the Trustee shall be sufficient discharge to the purchaser or pur-
chasers at any sale or sales made by the said Trustee under or
57 in pursuance of any or either of the provisions for that purpose herein contained for his or their purchase money; and that such purchaser or purchasers, his or their, heirs, executors, or administrators shall not after payment thereof and having such receipt be liable to see to its being applied for or upon the purpose and trusts of these presents or in any manner howsoever be answerable for any loss, misapplication or non-application of such purchase moneys or any part thereof, or be obliged to inquire into the necessity, expediency or authority of or for any such sale.

Sixth Clause. And in case of any foreclosure sale, or of any sale made under any of the provisions of this deed of trust, the purchaser or purchasers thereat shall be entitled in making settlement for, and

payment of, the purchase money therefor, to deliver to the then Trustee, toward the payment of such purchase money, any of the said bonds and interest coupons secured hereby, and held by such purchaser or purchasers, counting such bonds and interest coupons for such purpose at a sum not exceeding that which shall be payable out of the net proceeds of such sale, to the holder or holders of such bonds and interest coupons, as his or their share and proportion in that character of such net proceeds of sale, after allowing for the proportion of payment which may be required in cash for the costs and expenses of the sale and if such proportionate sum shall be less than the amount of such bonds or interest coupons, to make such settlement by receipting thereon for the amount to be credited
58 thereupon.

Seventh Clause. And in case of any such default in the payment of the interest or any instalment or part of any installment of such interest on said bonds or in case of any such default, neglect, refusal or failure to observe, *do* keep or perform all and singular the covenants, promises, stipulations or provisions in said bonds and coupons and in this deed of trust contained as specified in Clause Fourth of these presents, and in case such default in paying said interest or such default, neglect, refusal or failure shall extend for the period of ninety days or in case of a default in the payment of the principal of said bonds, then on the written request of a majority in interest of the said bonds then outstanding unless such default be waived as herein required, the said party of the second part shall enter in and upon and take possession of all and singular the above described water works, property, premises, rights, privileges, franchises, appurtenances, contracts, choses in action, assets and effects, whether owned by the party of the first part at the date of these presents or thereafter acquired, conveyed or intended to be conveyed by these presents or by any conveyances supplementary hereto and each and every part thereof, and it shall be lawful for the said party of the second part on making such entry to exclude the said party of the first part and its agents wholly therefrom and to hold and use the same, and control, manage and operate by its employees, agents, servants, managers and attorneys the said water works,
59 property, rights, privileges, franchises, appurtenances, choses in action, assets and effects and to conduct and manage the business of supplying water in the City of Columbus, and its vicinity, and to make from time to time at the expense of the trust estate, all repairs and replacements, and such useful alterations, extension, additions and improvements thereto and to do all other matters and things which will promote the interests of the parties hereto or may seem to it, the said Trustee judicious and proper, and to collect and receive all water rents, rents, incomes, issues and profits and every part thereof and after deducting the expenses of operating said water works and conducting said business and paying all legitimate debts and obligations and for all repairs, alterations, extensions, additions and improvements as aforesaid, and all taxes, assessments and other proper charges on said property and premises or any part thereof as well as a just and reasonable compensation for its own services, and the services of all agents, clerks and servants properly

engaged and employed, including reasonable Attorney's and Solicitor's fees, then to apply the moneys arising as aforesaid to the payment of the interest in arrear or which shall become due on the outstanding bonds hereby secured and to the payment of the principal of said bonds as provided in Clause First of these presents.

Eighth Clause. No delay or omission of the said Trustee or of the holders of the bonds secured hereby in respect of any
60 default happening or continuing as aforesaid, to exercise the rights and powers arising therefrom as hereinbefore provided shall be held to exhaust or impair such rights and powers or be construed to be a waiver of such defaults; but it is hereby mutually agreed as a condition subject whereto the bonds secured hereby are issued and held by each successive holder that the holders of a majority in interest of said bonds at any time outstanding may by an instrument under their hands or by resolution adopted at a meeting of such bondholders waive, or instruct the Trustee to waive, any default occurring and the rights accruing therefrom on such terms and conditions or without any conditions as to such majority may seem proper; provided always, that no such action of the bondholders shall extend to or be taken to affect any subsequent default or impair the rights resulting therefrom, or to authorize any subsequent breach of any condition herein. And subsequent defaults may be waived in the same way, but without affecting defaults thereafter occurring or authorizing breaches of conditions.

Ninth Clause. The Trustee shall be entitled to be re-imbursed for all proper outlays of every sort or nature by it incurred in the discharge of its trusts, and to receive a reasonable and proper compensation for any duties that it may at any time perform in the discharge of the same; and all such fees, commissions, compensations and disbursements shall constitute a lien on the mortgaged property and premises.

61 Tenth Clause. In no event shall any expense of any kind fall upon said Trustee but all its expenses and costs, including the fees and charges of Attorneys, and agents employed by it, in good faith, in the administration of the trusts herein contained, shall be paid by the party of the first part.

Eleventh Clause. The Trustee shall only be responsible for reasonable diligence in the performance of the trust, and shall not be answerable in any case, for the act or default of any agent or attorney or employee selected with reasonable discretion.

Twelfth Clause. Should any suit or other proceeding be brought against the Trustee, by reason of any matter or thing connected with the trusts, hereby created, or by reason of its being such Trustee it shall be under no obligation to enter any appearance by counsel, or in any way appear in and defend the said suit or other proceeding, until indemnified to its satisfaction for so doing, but it may nevertheless appear and defend the same without indemnity, if it shall elect to do so, and in such case it shall be compensated therefor from the trust fund.

Thirteenth Clause. In case at any time it shall be necessary or proper for the said Trustee to make any investigation respecting any facts preparatory to taking or not taking any action, or doing

or not doing anything as such Trustee, the certificate of the party of the first part under its corporate seal attested by the signature of its President and the affidavit of one or more directors shall
62 be sufficient evidence of such fact to protect the Trustee in any action that it may take by reason of the supposed existence of such fact.

Fourteenth Clause. It shall be no part of the duty of the party of the second part to see to the recording of this Indenture as a mortgage or conveyance of real estate, or to the filing thereof as a Chattel Mortgage or renewing such Mortgage, or to do any other act which it may be suitable and proper to be done for the continuing of the lien of this Indenture, or for giving notice of the existence of such lien; nor shall it be any part of its duty to effect insurance against fire or other damage on any portion of the mortgages property, or to renew any policies of insurance.

Fifteenth Clause. The right of action under this Indenture is vested exclusively in the Trustee, and under no circumstances shall any bondholder or any number of bondholders, have any right to institute an action or other proceeding, on or under this Indenture, for the purpose of enforcing any remedy herein and hereby provided, except in case of refusal on the part of the Trustee to perform any duty imposes on it by this agreement; and all actions and proceedings for the purpose of enforcing the provisions of this Indenture shall be instituted and conducted by the Trustee according to its sound discretion, but the Trustee shall be under no obligation to institute any such suit or to take any proceedings under this Indenture until it shall be indemnified to its full satisfaction for all the expenses and costs of every kind, and also for possible
63 claims for damages.

Sixteenth Clause. The party of the second part, as Trustee or otherwise, shall be under no obligation to recognize any person or persons, firm or corporation, as holder or holders, owner or owners, of one or more of the bonds secured hereby, or to do or to refrain from doing any act pursuant to the request or demand of any person or persons, firm or corporation, professing or claiming to be such holder or owner, until such supposed holder or holders shall produce the said bonds, and deposit the same with the Trustee, and shall indemnify and save harmless the Trustee, to its full satisfaction, from any and all costs and expenses, outlays and counsel fees and other reasonable disbursements for which it may become liable or responsible on proceeding to carry out such request or demand.

Seventeenth Clause. And the said Trustee or any successor in this Trust shall have the Power to release from the lien of this deed of trust any land, machinery or other property, which may no longer be necessary or useful for the purposes of the party of the first part; but only on condition that such property be forthwith replaced by other property of equal value and subject to the lien of these presents.

Eighteenth Clause. The said party of the first part for itself its successors and assigns and so as to bind all persons who may claim through or under it as assigns, junior encumbrances, lienholders or

otherwise doth hereby irrevocably waive the benefit or ad-
64 vantage of any or all valuation, stay, appraisement, redemption or extension laws, and of all laws requiring mortgages, liens, hypothecations, deeds of trust, or other securities for money to be foreclosed by action therefor, now existing or which may hereafter exist in the State of Georgia or any other State wherein the property to be sold hereunder or any part thereof, may at the time of sale be situated, or where the said sale may take place, which but for this stipulation herein might prevent or postpone the sale of said premises, property, rights and interests to the purchaser under the power and in compliance with the provisions herein provided.

And the said party of the first part does hereby covenant with the said party of the second part the said Trustee its successor or successors in the trust hereby created, that it will not in any manner set up or seek to take the benefit or advantage of any such valuation, stay, appraisement, redemption or estension laws.

Nineteenth Clause. Said party of the first part for itself and all other persons hereafter claiming through or under it or who may at any time hereafter become holders of liens junior to that of these presents, hereby expressly waives and releases all right to have the assets comprised in the security intended to be created by these presents marshalled upon any foreclosure or other enforcement thereof, and it is expressly hereby agreed and declared that the Trustee herein and any Court in which foreclosure of these presents
65 or administration of the trust hereby created is sought shall have the right to sell the entire property of every description comprised in or subject to the Trustee of these presents as a whole in one single lot if it shall in its discretion think fit. And a majority in interest of said bonds, may by instrument in writing direct the trustee or petition the said Court to sell the said property in such manner.

Twentieth Clause. And the said party of the first part doth covenant, bargain and agree to and with the said party of the second part, as follows:

A. That it, the said party of the first part shall well and truly pay the holders of the bonds hereby secured the interest thereon semi-annually as the several coupons attached to said bonds shall mature and at the time and place therein specified, and at the maturity of said bonds shall pay off and satisfy fully the principal and interest of said bonds without reduction or rebate from any cause whatever.

B. That it, the said party of the first part will do and perform all acts and things, promises and covenants in any article or clause of this Indenture on its part to be done, performed or kept.

C. That there is no encumbrance on any of its property, rights, choses in action or assets hereby conveyed or intended to be conveyed.

D. That at all times during the continuance of this deed of trust it, the party of the first part will promptly and before any
66 penalty or forfeiture shall attach in due season pay or cause to be paid all taxes, levies and assessments laid upon it or its property or assets by any lawful authority.

And in case of failure to do so the said Trustee may pay the same and add the same to the amount secured by this Deed of Trust and the same with six per cent. interest shall be preferred to the debt evidenced by said bonds and coupons, but such payment shall not be considered a waiver of any forfeiture under the provisions of this deed arising from the breach of the covenant to pay said taxes.

E. That it, the said party of the first part will at any time in the future upon demand at its own expense execute and deliver and record (if proper for record) all such further and other conveyances assignments, mortgages and supplementary deeds of trust of the rights, privileges, franchises, easements, choses in action, property real and personal, effects and assets used or to be used in the supply of water in the City of Columbus, and its vicinity, now owned by it whether covered by this conveyance or not *any* of any rights, privileges, franchises, easements, choses in action, property real and personal, effects and assets which it may at any time hereafter acquire and in anywise connected with the property hereby conveyed and to be used for the purposes above specified, as the party of the second part may demand to subject the same to the lien of this deed of trust and such further and other conveyances, assignments, mort-
67 gages and supplementary deeds of trust of the rights, privileges, franchises, easements choses in action, property real and personal, effects and assets used or to be used in the supply of water in the City of Columbus and its vicinity, now owned by it whether covered by this conveyance or not, and of any rights, privileges, franchises, easements, choses in action, property real and personal, effects and assets which it may at any time hereafter acquire and in anywise connected with this property hereby conveyed and to be used for the purposes above specified, as the party of the second part may demand to subject the same to the lien of this deed of trust and such further and other conveyances, assignments, mortgages and supplementary deeds of trust shall be deemed a part of this instrument and form together one security for the payment of the debt evidenced by said bonds and coupons.

F. That the said party of the first part, will not commit or suffer to be committed any waste of its property or assets; that it will not release any contract it now has with the City of Columbus, or any person or persons whereby the income of the party of the first part shall in any way be diminished either annually or in gross without the consent of the party of the second part.

G. That during the continuance of this deed of trust, the said party of the first part will not do or suffer to be done any act or acts whereby the security of the said bondholders shall be in any way or manner or in any amount impaired, and that the said party
68 of the first part will at all times, maintain, preserve and keep its water works, pumps, machinery, reservoirs, piping, hydrants and equipments in good repair, working order and condition and supplied with all the machinery, equipments and appliances for providing water to the City of Columbus and vicinity and shall and will from time to time make all needful and proper re-

pairs, renewals and replacements and useful and proper alterations, additions, betterments and improvements.

H. That during the continuance of this Deed of Trust, it, the party of the first part will not suffer or permit any lien of mechanics or material men or others of any kind or any incumbrance of any kind upon any of the property to be hereafter acquired for extending, renewing, or improving its water works which shall be a prior lien to the lien of this Deed of Trust or before the execution of an instrument subjecting the same to this Deed of Trust.

I. That the said party of the first part will cause the buildings, machinery and other property conveyed or intended to be conveyed by these presents, which may be liable to be destroyed by fire, to be insured to the amount of three fourths at least of their value and such insurance shall be continued by renewals from time to time, and in case of loss to apply the monies arising from such insurance to the renewal, rebuilding and restoration of the works and such renewals and restorations or rebuildings are to be subject to the lien of these presents.

69 Twenty First Clause. The said Trustee, the said party of the second part, hereby promises and agrees:

A. That in no case will it deliver or certify any of the bonds hereby secured, except in conformity with the provisions of this Instrument.

B. And the said party of the second part hereby stipulates and agrees that it will safely keep the one hundred and seventy five bonds numbered consecutively from number three hundred and twenty six (326) to number five hundred (500) both inclusive to be deposited with it according to the resolutions hereinbefore set forth and the terms of this Instrument and will not issue or deliver the same or suffer the same to become outstanding except for the use and purposes and in the manner expressed in this Deed of Trust and said resolutions.

Twenty Second Clause. And it is further stipulated and agreed that in case the said Trustee shall desire, for any reason, to surrender the trust conferred upon it by this instrument, it may at any time do so, and may nominate its successor, and if the person so nominated is a fit and proper person, the said party of the first part shall, by resolution of the Board of Directors, confirm the said nomination and certify the same to the party of the second part; and in such case the said party of the second part may transfer the trust, by Deed properly executed, to the successor so chosen, or the

70 party of the second part may in its discretion in the first instance, or in case the parties fail to agree, and with or without the consent of the party of the first part, apply to any Court then having equity jurisdiction in the County in which the mortgaged property, or any part thereof, shall then be situated, either a Court of the United States or of the State of Georgia, for the appointment of such successor, and such Court may appoint a successor to the party of the second part; and it is agreed and stipulated that the successor so appointed, whether by act of the parties or by a

Court upon accepting the same, shall succeed to all the interest, rights, and privileges, and be subject to all the duties and obligations pertaining to the party of the second part hereto, and to all intents and puuposes become and be the party of the second part to this instrument and any subsequent or supplementary assignment, conveyance or mortgage, the same as if originally named therein.

Twenty Third Clause. And it is understood and agreed that all the conveyances, covenants, conditions, agreement, stipulations and provisions herein mentioned and contained apply to and bind the successors and assigns of the respective parties as fully as the parties themselves.

Twenty Fourth Clause. The recitals herein contained are made on behalf of the party of the first part, and the party of the second part assumes no responsibility as to the correctness of any statement therein contained.

71 In Witness Whereof, the said The Columbus Water Works Company and the said The Mercantile Trust and Deposit Company of Baltimore have hereunto caused their respective common or corporate seals to be affixed, dated the day and year first above written.

[Seal Columbus Water Works Co.]

THE COLUMBUS WATER WORKS COMPANY,
By H. H. EPPING, *President.*
W. S. TOWNSEND, *Treasurer.*

Signed, sealed and delivered in the presence of us,
H. C. MERRICK,
SAMUEL L. TAYLOR.
As to the signatures of H. H. Epping and W. S. Townsend and the Columbus Water Works.

[Seal Mercantile Trust and Deposit Co. of Baltimore.]

THE MERCANTILE TRUST AND DEPOSIT COMPANY OF BALTIMORE,
By JOHN GILL, *President.*
L. C. FISCHER, *Treasurer.*

Signed, sealed and delivered in the presence of us,
THOS. B. HORWITZ,
G. EVETT REARDON,
A Commissioner for Georgia in Maryland, Residing in Baltimore City.

As to the signatures of John Gill and L. C. Fischer, President and Treasurer and the Mercantile Trust and Deposit Company of Baltimore.

72 *Acknowledgments for the States of Georgia and Alabama.*

THE STATE OF ALABAMA, *Lee County:*

I, W. C. Robinson, Judge of Probate Court, for the County of Lee and State of Alabama, de hereby certify that the annexed deed of conveyance from the Columbus Water Works to the Mercantile Trust and Deposit Company of Maryland was filed in my office for record on the 20th day of January A. D. 1891, and was recorded on the 21st day of January A. D. 1891, in Record of Deeds, Vol. A-13, on page 149.

Given under my hand on this, the 21st day of January, A. D. 1891.

W. C. ROBINSON,
Judge of Probate.

Filed in office this January 22nd, 1891 at 10:20 A. M.

JOHN C. COOK,
Clerk Sup'r C. M. C., Ga.

GEORGIA, *Muscogee County:*

Clerks Office of the Superior Court of said County.

I, John C. Cook, Clerk of said Court do hereby certify that the annexed deed of conveyance from the Columbus Water Works to the Mercantile Trust and Deposit Company of Maryland was filed in my office for Record on the 22nd day of January 1891 and was Recorded on the 22nd day of January 1891 in Record of Mortgages Vol. G. Folio 500 to 522 inclusive.

Given under my hand and seal of said Court attached this
73 January 23rd, 1891.

[Seal Superior Court, Muscogee County, Georgia.]

JOHN C. COOK,
Clerk, S. C. M. C., Ga.

74 EXHIBIT "B."

Here follows the contract made and entered into 7th day of October, 1881, between Thomas R. White, of the City of Philadelphia, State of Pennsylvania, and such other persons as may be associated with or incorporated with him, and the Mayor and Council of Columbus, for the construction and operation of an effective system of water works for the supply of the city with water for the various uses required, which contract is set out, commencing on page 222 and ending on page 242 of this record. Said contract having been introduced in evidence by the complainant.

75 *Letter of B. F. Archer to City Council of Columbus.*

EXHIBIT "C."

COLUMBUS, GA., *Oct.* 31, 1882.

To the Honorable Mayor and Council of the City of Columbus.

GENTLEMEN: In behalf of the Columbus Water Works Company, the undersigned begs leave to inform your Honorable body that in accordance with the contract made between yourselves and Mr. Thos. R. White, and subsequently transferred to our company, we have completed the system of water supply for your city, and reservoir is amply provided, and the mains are now full, and the water ready for distribution and use, under the terms of said contract. We feel that we are justified in saying that the work has been done by our company in the most complete and substantial manner, in which neither time, nor expense has been spared, and in adding our assurance that the water supplied will be wholesome, abundant and lasting; and we trust that your Honorable Body, as well as the citizens of Columbus generally, will find everything connected with our work as satisfactory as we have endeavored to make it so. The magnitude and substantial character of the work, which has greatly increased the expenses of the undertaking of the company, will we trust fully compensate for the delay in its completion.

76 *Acceptance of Water Works System by City Council of Columbus.*

The company desires that your Honorable body may take some official action signifying your acceptance of the work, and the adoption of such suitable measures as may be requisite for the more fully carrying into effect the provisions of said contract.

All of which is respectfully submitted.

B. F. ARCHER,
President Columbus Water Works Company.

It being stated that the filters of the reservoir differed from the one prescribed in the contract, Mr. Thos. R. White was sent for, who explained that the one built was an improvement over the one described in the contract for the reason that it could be easily taken out and cleaned, which explanation was satisfactory.

The committee on water works offered the following, which was adopted:

"Resolved, that the Mayor and Council of the City of Columbus, being satisfied that the water works for the supply of water for the city and citizens of Columbus, has been completed by the Columbus Water Works Company in accordance with the contract made between the said Mayor and Council and Thos. R. White, on the 7th day of October, 1881, and subsequently on the third day of April, 1882, transferred to the said Columbus Water Works Company, and

the said Mayor and Council hereby accept the same, and the
77 committee are hereby authorized to locate drinking fountains and adopt such other measures that may be necessary for the full execution of said contract.

Ald W. H. Brannon, N. N. Curtis, Mr. Jno. Hill, Mr. W. R. Brown, Com.

The foregoing two pages of typewritten matter are a true extract from the minutes of the proceedings of the City Council of Columbus, held on November 6, 1882.

78 *Ordinance authorizing issue of $250,000 of bonds with which to build a system of municipal water works, etc.*

EXHIBIT "D."

An ordinance submitting to the qualified voters of the City of Columbus, the question of the issuance of Two Hundred and Fifty Thousand Dollars of bonds of the City of Columbus at a special election to be held for that purpose on the 4th day of December, 1902, said bonds to bear interest at the rate of four per cent. per annum, payable semi-annually, and to mature in 25 years from the date of their issue, ten thousand dollars of the principal of said bonds to be paid annually, the proceeds to be derived from the sale thereof to be used only for the purpose of building, equipping, operating and owning a system of water works by the City of Columbus; and providing for the opening of a special registration and for other purposes:

Whereas, the Columbus Water Works Co. has totally failed to supply the City of Columbus and its inhabitants with a sufficient quantity of pure and wholesome water; and

Whereas, the public health of the City of Columbus is paramount in importance to every other consideration; and the owning by the City of Columbus of her own water works would result in a great saving in the cost of fire protection, sanitation and other purposes; and as the amount necessary to be expended in the construction and equipment of water works and appurtenances can only be raised by an increased rate of taxation, or by the issue and sale of a series of bonds of the city, and

79 Whereas, it is believed that the principal and interest of a sufficient amount of bonds necessary to raise a sum sufficient to construct, establish and equip a proper system and plant of waterworks can be met through a series of years without an increase in the taxation, and

Whereas, the present bonded indebtedness of the City of Columbus, to-wit: the sum of five hundred and three thousand and five hundred dollars is much less than seven per cent. of the assessed valuation of all the taxable property in said city, which in round numbers is eleven million six hundred thousand dollars; and that under the Constitution and Laws of this State, the City of Columbus, with the assent of two thirds of the qualified voters thereof can legally issue

a series of bonds to the amount of two hundred and fifty thousand dollars in addition to the present bonded indebtedness; therefore

It is ordained by the Mayor and Board of Aldermen of the City of Columbus, as follows:

SECTION 1.

That in accordance with the Constitution and laws of this State a special election shall be held by the qualified voters of the City of Columbus, on the 4th day of December, 1902, to determine the question whether or not the city shall issue its bonds in the sum of two hundred and fifty thousand dollars, the same bearing interest at four per cent. per annum, as hereinafter more fully set forth.

SECTION 2.

That for the purposes of said election and according to the
80 provisions of the charter of the City of Columbus, the Clerk of Council is hereby ordered to open a special registration of the voters of said city three months prior to the fourth day of December, 1902, said registration to be held and conducted under the same rules and regulations that govern annual registrations for the election of Mayor and Aldermen of said city.

SECTION 3.

That notice of said special election shall be published in "The Columbus Ledger," the same being the newspaper in which the sheriff's advertisements for the County of Muscogee are published, for thirty days next preceding the day of said special election, as is by law provided; and that at said election the qualified voters of the City of Columbus, to-wit: those who have registered in the special registration herein provided for, shall be entitled to vote for or against the issue of said bonds; that said election be held at the court house, in said city, between First and Second Avenues and Ninth and Tenth Streets, the same being the place where annual elections for Mayor and Aldermen are held; and that said election shall be held in the same manner and under the same rules and regulations as govern the annual elections for Mayor and Aldermen for said city; and in accordance with the charter of said City of Columbus; and that re-
turns of said election be made and the votes cast therein be
81 counted and consolidated in the same manner as govern said elections for Mayor and Aldermen of said city.

SECTION 4.

That said election be held for the purpose of ascertaining whether the qualified voters of the City of Columbus will assent to the issue and sale of Two Hundred and Fifty Thousand Dollars of bonds of the city of Columbus, numbered from 1 to 250, inclusive, of the denomination of one thousand ($1000.) dollars each; and to be designated as "Water Works Bonds:" and to be used for the purpose of building, establishing, equipping and owning and operating a system of water works with the necessary sites, ways and structures

therefor for the City of Columbus, all of which is to be located at such places of places as may be hereafter selected by the city authorities, and the same to be the property of the City of Columbus. The principal of said bonds is to be paid in the following manner, to-wit:

Ten thousand ($10,000.) dollars to be paid off at the end of one year from the date of the issuance thereof; and ten thousand ($10,000.) dollars to be paid off each and every year thereafter, so that the last instalment of said bonds shall become due and payable twenty-five years from the date of the issuance thereof. Said bonds to be paid off and retired each year shall be in the order in which they are numbered, that is to say, bonds numbered from one to ten inclusive shall be paid off at the end of the first year and
82 from 11 to 20 inclusive at the end of the second year, and so on in that manner until all of said bonds shall have been fully paid off and discharged. Said bonds are to bear interest from the date of their issue at the rate of four (4) per cent. per annum and to become due and payable semi-annually on the first days of April and October in each year, and said bonds to be due and payable at the City Treasury in Columbus, Ga., both principal and interest, and are to be payable in gold coin of the United States of America of the present standard of weight and fineness. That said bonds if authorized to be issued by the qualified voters of Columbus shall be signed by the Mayor and Treasurer of the City of Columbus and shall have the Corporate Seal of the city affixed thereto by the Clerk of Council; and the interest coupons on said bonds shall be signed with a fac simile engraved signature of the said Treasurer. Said bonds are to be sold to the highest and best bidder for cash, under such rules and regulations as may be hereafter prescribed by the Mayor and Board of Aldermen, but the same are not to be sold for less than par; and the proceeds derived from the sale thereof are to be used for the sole purpose of building, constructing, establishing, equipping and owning a system of water works, together with the necessary sites, ways and structures therefor to the extent that the same can or may be done by the expenditure of the proceeds of the sale of said issue of two hundred and fifty thou-
83 sand ($250,000.) dollars of bonds.

SECTION 5.

That notice of this election shall be given, as required by law, for thirty days next preceding the said day of election in "The Columbus Ledger," a newspaper published in the City of Columbus, the same being the newspaper in which the sheriff's advertisements for the County of Muscogee are published.

SECTION 6.

That at said election every duly qualified voter of said city who shall have registered for this election under the special registration hereinbefore provided for, to be held on the 4th day of December, 1902, shall be entitled to vote for or against the issuance of said water works bonds and that at said election each voter shall have written

or printed on his ballot "For Water Works Bonds" or "Against Water Works Bonds."

SECTION 7.

That in the event the issue of bonds proposed herein is assented to by two thirds of the qualified voters of said city at said election and the same shall have been validated, as by statute provided, an annual tax shall be thereafter levied and collected by the Mayor and Board of Aldermen of the City of Columbus on the taxable property within said city sufficient to pay the interest semi-annually as aforesaid on said issue of bonds, or so much thereof as may not be paid from the income to be derived from said water works, and for the pay-
84 ment of the interest on such of said bonds as may not have been paid off for each and every year thereafter; and for the payment annually of ten thousand dollars of the principal of said bonds, or so much thereof as may not be paid from the income to be derived from said water works, so that the principal and interest of said bonds shall be paid off and extinguished at the respective dates of maturity as fixed in this ordinance.

SECTION 8.

That in the event the assent of the qualified voters of the City of Columbus is given at said election to issue said bonds as herein provided, and when the same shall have been validated, as by law required, then before the issuance and sale of the same and the incurring of the indebtedness by the City of Columbus, an ordinance or ordinances, shall be passed by the Mayor and Board of Aldermen of the City of Columbus providing for the issue and sale of said bonds at such times and in such a manner as the same may be needed for the purpose of constructing, building and owning such system of waterworks; and also providing for the appropriation of the proceeds of the sale of the same as in this ordinance set forth. And also for *the* making provision for the assessment and collection of taxes sufficient to pay the principal and semi-annual interest on said bonds sufficient to discharge them in accordance with the provisions of this ordinance.

Also providing that the net income to be derived from the water works after paying the annual expenses of maintaining and
85 operating same shall be pledged and applied primarily to the payment of the interest on said bonds and in paying the bonds as they mature each year.

Also for making provision for the assessment and collection each year of a tax sufficient to pay the interest on said bonds and to pay said bonds as they mature, or so much thereof as may not be paid from the income to be derived from the water works.

SECTION 9.

In event the assent of the qualified voters of the City of Columbus is given at said election to issue said bonds as is herein provided, and when the same shall have been validated as by law required, there-

after the water works shall be considered a separate and distinct department of the City Government, and it shall be the duty of the Mayor and Board of Aldermen before the issuance of the bonds, to provide by ordinance for the election by the Mayor and Board of Aldermen of a commission to consist of four members who, together with the Mayor as an *ex-officio* member shall be known as the Water Commission, and said Commission shall have control of the building, operating and management of the water works. The said ordinance shall plainly state the powers, duties and obligations of the said Commission.

SECTION 10.

That said bonds and coupons herein provided for, when issued, shall be free and exempt from taxation by the City of Columbus; and shall be receivable by the city for all taxes or dues to the city.

86

SECTION 11.

That J. M. Lennard, J. G. Moon, Joseph Phipps, A. W. Cozart, be and they are hereby appointed managers of said bond election as herein provided for; and that Will Ligon, Jacob Feiler, R. J. Hunter, W. R. Bedell be and they are hereby appointed clerks at said election. If the managers or clerks named in this section or any of them decline or fail to serve, the mayor shall appoint others legally qualified to fill such vacancies; and the sum of forty dollars is hereby appropriated for the purpose of paying said managers and clerks and other expenses incident to said election, as by law provided, *to the first meeting of the mayor and board of aldermen of the City of Columbus*, after said election shall have been held; and that said polls for the purpose of receiving votes at said election shall open at six o'clock A. M. and close at seven o'clock P. M.

SECTION 12.

That all laws and parts of laws in conflict herewith be and the same are hereby repealed.

87 *Letter from John C. Cook, Sec'y Board Water Commissioners, to City Council of Columbus, requesting Council to Invite Bids for Bonds.*

EXHIBIT "E."

COLUMBUS, GA., *May* 6, 1903.

To the Honorable Mayor and Board of Aldermen of the City of Columbus.

GENTLEMEN: As secretary of the board of water commissioners of the City of Columbus, I beg to advise your Honorable body that at a meeting of said commissioners held on the 5th inst., a motion was unanimously adopted that you be requested to invite bids for the

bonds of said city for the purpose of constructing a system of water works for said city; said bids to be opened on August 1st, next.

Very respectfully, JOHN C. COOK,
Secretary Board Water Commissioners.

Alderman Newman offered the following resolution, which was adopted:

Whereas, it appears from a communication received from the board of water commissioners that active steps are being taken to build the system of water works to be owned and operated by the city, and that they will at some time in the near future desire the use of the money to be derived from the issue and sale of the bonds of the city recently authorized by the qualified voters of the city in the sum of two hundred and fifty thousand dollars. It is
88 therefore resolved by the mayor and board of aldermen of the City of Columbus as follows:

That the finance committee in conjunction with the mayor, be and they are hereby authorized and directed to advertise for bids for said bonds in such manner and to such extent as to them may seem fit and proper to obtain the highest possible price therefor, said bids to be opened on the first day of August, 1903, with the right reserved to accept or reject any and all bids that may be made therefor.

89 *Circular Letter Issued by City of Columbus Inviting Bids for Issue of $250,000 of Bonds for the Purpose of Building System of Municipal Water Works.*

EXHIBIT "F."

$250,000 4% Municipal Water Works Bonds.

COLUMBUS, GA., —— —, 1903.

Sealed bids for the purchase of these bonds are invited and will be received by the City of Columbus up to noon of Saturday, August 8, 1903.

For the purpose of constructing, owning and operating a system of water works, the City of Columbus, Georgia, will offer for sale $250,000 twenty five year serial, four per cent., April and October coupon gold bonds, of the denomination of one thousand — ($1000)., dated October 1, 1903; ten thousand dollars maturing October 1, 1904, and ten thousand dollars annually thereafter up to and including October 1, 1928; the principal and interest being payable in gold at the office of the City Treasurer in Columbus, Georgia.

The interest coupons will mature on April 1st, and October 1st, each year.

The bonds will mature as follows:

$10,000 due October 1, 1904.
$10,000 due October 1, 1905.
$10,000 due October 1, 1906.

$10,000 due October 1, 1907.
$10,000 due October 1, 1908.
$10,000 due October 1, 1909.
$10,000 due October 1, 1910.
$10,000 due October 1, 1911.
$10,000 due October 1, 1912.
$10,000 due October 1, 1913.
$10,000 due October 1, 1914.
$10,000 due October 1, 1915.
$10,000 due October 1, 1916.
$10,000 due October 1, 1917.
$10,000 due October 1, 1918.
$10,000 due October 1, 1919.
90 $10,000 due October 1, 1920.
$10,000 due October 1, 1921.
$10,000 due October 1, 1922.
$10,000 due October 1, 1923.
$10,000 due October 1, 1924.
$10,000 due October 1, 1925.
$10,000 due October 1, 1926.
$10,000 due October 1, 1927.
$10,000 due October 1, 1928.

The issue and sale of these bonds have been authorized by the qualified voters of the city of Columbus at an election held on the 4 day of December, 1902, as provided by law, pursuant to sections 377 to 381, inclusive of Vol. 1, of the Civil Code of Georgia for 1895, and pursuant to the provisions of the Constitution as embodied in Paragraphs 1 and 2, Section 7, Article VII. Said bonds have been validated and confirmed by the Judge of the Superior Court of Muscogee County, in conformity with an Act of the General Assembly of Georgia, approved December 6, 1897 (see Acts 1897, page 82), which judgment of validation has been passed upon and affirmed by the Supreme Court of Georgia.

The total number of qualified voters for the election was	1,734
Favorable votes required for authorization	1,156
Favorable votes cast	1,640
Unfavorable votes cast	7
Number of qualified voters who failed to vote	87
Population of Columbus by the U. S. Census of 1900	17,614
Estimated present population	20,000

Assessed valuation of taxable property	$13,094,094.00
91 Bonded debt authorized by charter 7 per cent.	$916,586.00
Present bonded debt, including this issue	$746,500.00
Floating debt	None.

Bonded debt of the City of Columbus, Ga., Jan. 1, 1903.

Due 1903, (College Bonds)	$4,000	
Due 1904, 5 per cent	$10,500	
1905, 5 per cent	$17,500	
1906, 5 per cent	$5,500	
1907, 5 per cent	$10,500	
1908, 5 per cent	$11,000	
1909, 5 per cent	$258,000	
		$317,000
1927 4½ per cent	$55,000	
1928 4½ per cent	$50,000	
		$105,000
1931 3½ per cent	$38,500	
		$38,500
1904 to 1912 4 per cent. Bridge Bonds, $4,000 each year	$36,000	
		$36,000
Total		$496,500

No question as to the validity of any Columbus Bonds has ever been raised, nor has this city ever defaulted in the payment of principal and interest of its bonded debt.

In addition to the general credit of the city, the net revenue from the operation of the water works is pledged, by an Act of the General Assembly of Georgia, for the payment of the principal and interest on these bonds.

92 Purchasers of these bonds must take same in lots of $25,000 or multiples thereof, in order that each purchaser will receive a proportionate share of the bonds maturing each year. The bonds will be delivered to purchasers at Columbus, Ga., and final payment required on January 1st, 1904.

Each bid must be accompanied by a certified check for two and one-half per cent. of the face value of the bonds bid for, the amount of said check to be credited on the purchase in case of acceptance, or returned in case of rejection of the bid.

The City of Columbus reserves the privilege of rejecting any and all bids.

Respectfully,

L. H. CHAPPELL, *Mayor.*

E. P. DISMUKES,
E. J. WYNN,
W. J. HARTMAN,
Finance Committee.

93 *Nisi on Original Bill Filed by Complainants.*

At Chambers, Atlanta, Ga., *29th July*, 1903.

Read and considered. It is ordered that the bill be filed and served. Let all the defendants named therein show cause at the

United States Circuit Court Room, at Atlanta, Ga., on Monday, September 28th, 1903, at ten o'clock, A. M., why an injunction should not issue as prayed.

If defendants desire to file response by way of answer, or affidavits to be used on the hearing of this application for injunction, let the same be filed on or before September 5th; and should the complainant desire to introduce affidavits in response, let such affidavits be filed on or before September 19th, 1903.

WM. T. NEWMAN, *U. S. Judge.*

Filed in Clerk's office, July 30, 1903, at 9:30 A. M.

O. C. FULLER, *Clerk,*
By N. A. BROWN, *Deputy.*

94 *Demurrer of City of Columbus et al., to Original Bill Filed by Complainants.*

Filed 11th of September, 1903.

In the Fifth Circuit Court of the United States for the Northern District of Georgia, Western Division.

No. 59. In Equity.

MERCANTILE TRUST & DEPOSIT CO. OF BALTIMORE,
vs.
CITY OF COLUMBUS, L. H. CHAPPELL, as Mayor, and E. P. DISMUKES, J. I. DARBY, W. C. LAWRENCE, J. D. McPHAIL, N. L. DUDLEY, L. T. JONES, R. WEILAND, J. T. MONCRIEF, J. L. NEWMAN, W. J. HARTMAN, L. A. CAMP, F. M. SOMMERKAMP, E. J. WYNN, J. H. McKNIGHT, MAX BANNER, and T. E. MITCHELL, as Aldermen of the City of Columbus.

Bill.

The joint and several demurrer of the City of Columbus and of the several other above named defendants to the bill of complaint of Mercantile Trust and Deposit Company of Baltimore, the above named plaintiff.

These defendants by protestation, not confessing or acknowledging all or any of the matters and things in the said plaintiff's bill to be true in such manner and form as the same are set out and alleged, do demur thereto upon the following grounds, to-wit:

First. Because the plaintiff has no such interest in the subject matter as will entitle it to maintain this suit, for that there is no privy of contract between the plaintiff and these defendants, or either of them nor are any facts alleged upon which an independent suit at the instance of the plaintiff can be predicated.

95 Second. Because even if the plaintiff has an interest in the subject matter of the suit, it has no proper title to institute a suit concerning it, for that it is not alleged that the plaintiff as trustee has been requested by a majority in interest of the holders of the bonds to institute and maintain this suit, nor does it appear under the mortgage or deed of trust set out as an exhibit to said bill that the trustee either has the right or is under any duty to institute and prosecute this suit of its own volition and in the absence of proper request.

Third. Because the plaintiff has no such interest in the subject matter of the suit as entitles it to call upon these defendants or either of them, to answer its demand.

Fourth. Because the plaintiff is not entitled to the relief which is prayed for in said bill.

Fifth. Because there is a want of proper parties, for that the Columbus Water Works Company, and W. S. Greene, as Receiver thereof are indispensable parties complainant.

Sixth. Because there is a mis-joinder of parties defendant, in this, to-wit:

(1) The Columbus Water Works Company is not a proper party defendant, for that its interest in the controversy is wholly that of a complainant, and there is no allegation that the Columbus Water Works Company has been requested to join in this suit and has refused so to do.

96 (2.) The Mayor and Aldermen are not proper parties defendant to this suit, for that they have no interest in the subject-matter thereof, inasmuch as the controversy set up in the bill relates entirely to transactions with and the actings and doings of the City of Columbus, which, as shown in said bill, is a municipal corporation of the State of Georgia authorized by law to sue and to be sued in the name of the City of Columbus.

Seventh. Because there is no equity in said bill, for that:

(1.) There is no obligation resting upon the city of Columbus, either contractual or otherwise, binding it not to erect its own system of water works.

(2) It is not alleged that the City of Columbus has revoked the franchise granted the Columbus Water Works Company or attempted so to do.

(3) The City of Columbus as a municipal corporation of the State of Georgia could not legally grant any exclusive franchise for the use of its streets to the Columbus Water Works Company, and any attempt so to do on the part of the Mayor and Council is utterly void and in contravention of the Constitution and laws of this State.

(4) If the City of Columbus has violated or should violate its contract with the Columbus Water Works Company by refusing to take or pay for the water, there is an adequate remedy at law, the injury being remedial in damages.

97 (5) The Columbus Water Works Company being insolvent and all of its property rights and assets having been placed in the hands of a receiver for administration under the orders

of this Honorable Court, the Columbus Water Works Company is utterly unable and has been deprived of the power to comply with its obligations under the contract with the City of Columbus.

Eighth. Because there is no federal question presented by the bill, it not being alleged that the City of Columbus has in its legislative capacity revoked the franchise of the Columbus Water Works Company or in any manner sought to impair the obligations of the contract.

Ninth. Because there is an adequate and complete remedy at law for the wrong and injury complained of, for that, if the City has improperly refused to make payment of one quarter's water rentals, or has otherwise failed to comply with its contract, such wrong and injury is capable of pecuniary estimation and is remedial in damages.

And for special cause of demurrer these defendants jointly and severally show:

1st. That the allegations contained in the 10th, 11th, 12th and 15th paragraphs of the bill alleging assent and acquiescence on the part of the citizens and inhabitants of the City of Columbus in and to the contract referred to is irrelevant, immaterial and argumentative.

98 Wherefore, and for divers other imperfections and errors contained in said bill, these defendants humbly pray the judgment if this Honorable Court whether they shall be compelled to make any further or other answer to the said bill or any of the matters or things therein contained, and pray to be hence dismissed with their reasonable costs in this behalf sustained.

T. T. MILLER,
J. H. MARTIN,
W. A. WIMBISH,
Of Counsel.

We certify that in our opinion the foregoing demurrer is well founded in point of law.

T. T. MILLER,
J. H. MARTIN,
W. A. WIMBISH,
Of Counsel.

STATE OF GEORGIA,
Muscogee County:

In person before the undersigned appeared L. H. Chappell, who being duly sworn deposes and says that he is the Mayor of the City of Columbus, one of the defendants named in the original bill referred to in the foregoing demurrer, and also appeared E. P. Dismukes, J. I. Darby, W. C. Lawrence, J. D. McPhail, N. L. Dudley, L. T. Jones, R. Weiland, J. T. Moncrief, J. L. Newman, W. J. Hartman, L. A. Camp, F. M. Sommerkamp, E. J. Wynn, J. H. McKnight, Max Banner and T. E. Mitchell, and upon oath severally

depose and say that they are aldermen of the said City of
99 Columbus and defendants named in said bill, and said deponents severally say that said demurrer is not interposed for delay.

L. H. CHAPPELL.
W. C. LAWRENCE.
F. M. SOMMERKAMP.
J. D. McPHAIL.
L. A. CAMP.
E. P. DISMUKES.
R. WEHLAND.
L. T. JONES.
T. E. MITCHELL.
W. J. HARTMAN.
J. H. McKNIGHT.
J. T. MONCRIEF.
E. J. WYNN.
J. I. DARBY.
N. L. DUDLEY.
MAX BANNER.
J. L. NEWMAN.

Sworn to and subscribed before me this Sept. 3, 1903.
[SEAL.] A. W. COZART,
Notary Public, Muscogee Co., Ga.

Filed in office 11th September, 1903.
O. C. FULLER, *Clerk.*
By N. A. BROWN, *Deputy.*

100 *Response of City of Columbus et al. to Rule Nisi.*

Filed on the 15 Day of Sept., 1903.

In the Fifth Circuit Court of the United States for the Northern District of Georgia, Western Division.

No. 59. In Equity.

MERCANTILE TRUST & DEPOSIT CO. OF BALTIMORE
vs.
CITY OF COLUMBUS ET AL.

Bill.

Response of the City of Columbus and of the Mayor and Aldermen of said city, defendants named, to the rule to show cause issued against them in the above entitled cause.

Now come the City of Columbus and the other defendants named in the original bill of file in the above entitled cause, (other than

the Columbus Water Works Company), and without waiving their demurrer heretofore filed but wholly relying thereon, by way of response to the rule issued against them to show cause why an injunction should not be granted as prayed in the bill, say:

First. It is admitted that the corporate character and citizenship of the separate parties are correctly set forth in the original bill, but it is denied that the individual defendants named as Mayor and Aldermen of the City of Columbus have any interest in the controversy, or are proper parties to the cause, the corporate
101 name of the city being "The City of Columbus" in which name it is authorized by law to sue and be sued.

These respondents deny that the plaintiff, Mercantile Trust & Deposit Company of Baltimore, has any interest in the controversy sufficient to entitle it to maintain this suit as against these respondents, or either of them. Respondents submit that the proper parties plaintiff to this controversy are the Columbus Water Works Company, or W. S. Greene, as receiver thereof, or both, and that the Columbus Water Works Company is improperly made a party defendant in the absence of an allegation and proof that it had been requested to join in a suit as party plaintiff and had refused to do so. And it is further submitted that the receiver of this court is an indispensable party plaintiff.

Second. Respondents do not deny that the Columbus Water Works Company issued the bonds and secured the same by mortgage or deed of trust and created the plaintiff as trustee, as is alleged in the first paragraph of the bill; but they are without information further than from the allegations of the bill regarding due execution and issuance of said bonds and deed, or of the number of bonds that have been delivered, or of the number now in the possession of the receiver of this court; but these respondents demand strict proof of the allegation that 392 of said bonds are now outstanding and held by persons who purchased the same in open market for value.

102 Third. Respondents deny that said bonds were issued and sold by the Columbus Water Works Company in order to raise money wherewith to construct, equip and complete a system of water works for the purpose of carrying out its contract with the City of Columbus, and on the contrary say that said bonds were not issued until nine years after the water works system was constructed. Respondents are informed and believe that no bonds were originally issued for the purpose of constructing the system of water works, and not until 1888 did the water works company issue bonds, and that the bonds then issued amounted in the aggregate to $150,000.00. Respondents state upon information and belief that the purpose for which said bonds were issued was not in order to construct, equip and complete a system of water works in accordance with the contract with the city; but that said bonds so issued in 1891 were used for the purpose of retiring the previous issue of 1888, and for the payment of dividends to stockholders of the Columbus Water Works Company, and for other purposes; that only the proceeds of a small number of said bonds have been used in extending, repairing or equip-

ping the system of water works; that the entire cost of the water works system, including all moneys that have been spent thereon since its original construction, is very much less than $392,000.00, and that said system does not represent a cost or value of any such sum of money.

103 Fourth. It is true that under date of October 21st, 1882, the Columbus Water Works Company by its President, submitted a communication to the Mayor and Council of the City of Columbus, stating that in accordance with the contract it had completed the system of water supply for the city, and that the water was then ready for distribution and use. On November 6th, 1882, this communication was considered by the mayor and council and it was stated that the filters of the reservoir differed from those prescribed in the contract. Whereupon, assurance was given by the water works company that the filter built was an improvement upon the one called for in the contract. Acting upon this assurance and upon the further assurance of the water works company that the system had been completed in accordance with the terms and requirements of the contract, as will be further shown and explained hereinafter, the mayor and council of the city adopted a resolution accepting the same, as appears from exhibit C attached to the bill. Respondents deny that the system was completed in accordance with the requirements of the contract in the following particulars:

1. The water works company failed to provide a storage reservoir for water, having an available capacity for the storage and supply of not less than one hundred and twenty five millions gallons of water when filled, as required by Article III of the contract, but instead thereof provided a reservoir having an available capacity of not more than forty million gallons of water. The capacity of

104 said reservoir was not known to the mayor and council of the City of Columbus at the time said work was accepted and was not known until in the year 1893, when, on account of the scarcity of water, the Mayor and Council had a survey and measurements made of the reservoir, and thereby ascertained the capacity thereof.

2. The water works company failed to provide street mains of such sizes as would afford an ample supply of water to consumers and for fire protection, as provided in Article IX of the contract. At the time of the acceptance of the work, there was no way by which the Mayor and Council of the City of Columbus could ascertain if the street mains were of sufficient sizes for the purpose intended, as there were no private consumers of water from the water works company, and no fire had occurred to demonstrate the capacity of the mains, and reliance was therefore had upon the assurance of the water works company that the sizes of said street mains were ample to supply water as provided in the contract.

3. The water works company failed to provide a filter for water distribution as provided in Article XI of the contract, and while it admitted that the filter of the reservoir differed from the one prescribed in the contract, the Mayor and Council were assured that the one built was an improvement on the one described in the contract

for the reason that it could be easily taken out and cleaned, when in truth and in fact the filter provided proved to be of no value whatever and was abandoned entirely in a short while after the
105 water works was completed.

4. The water works company failed to construct the storage reservoir as provided in Article XII of the contract, in that stumps, roots, alluvial deposits vegetable and unwholesome matter were not removed, but were allowed to remain in the reservoir, nor were thin edges to the water avoided by making of excavations and embankments along the margin of the reservoir, as provided, but around the greater portion of the reservoir there were no excavations made and the water was allowed to stand at thin or feather edges, the consequence of which was that the water became unwholesome and impure in seasons of dry weather.

Fifth. The allegations contained in paragraph 6th of the bill are substantially true.

Sixth. Respondents admit that the Mayor and Council of the City of Columbus did agree and promise by Article XV of said contract that "in order to make provisions for the payment of water rents, the Mayor and Council, in making appropriations for the fire and sanitary departments, shall appropriate a sum sufficient to pay the annual rental of the water works, and the mayor and council shall receive in payment for any taxes due the City of Columbus the due coupons of any bond issued by Thomas R. White, to an amount not exceeding the rental due by the city to him, in any one year, and the coupons thus taken shall be received by him in cash payment for said rentals," but respondents deny that said article of said contract was entered into on account of the "great anxiety of the people
106 of Columbus"; and they further deny that the agreement on the part of the city to receive due coupons for any taxes due the City of Columbus constituted an element of credit in the sale of the bonds, or was very valuable thereto, or enabled the water works company to sell the bonds at a better price than it otherwise would have obtained. Respondents submit that the agreement was simply an arrangement under which instead of paying the rentals due *pro tanto* directly to the water works company, the city consented to accept the due coupons in payment of obligations due to it by way of taxes, which was the equivalent of saying that payment should be made directly to the water works company or to the holders of the coupons of its bonds to the extent limited: In either case the credit of the city was pledged to the extent of the annual rentals due, and no further. Respondents deny that said bonds have passed into the hands of innocent holders for their full market value, and that said holders obtained said bonds relying to any greater degree upon the special provision for accepting due coupons in payment of taxes than upon faith that the city would perform the obligations of its contract generally. And respondents submit that said article XV of said contract, in so far as it sought to bind succeeding mayors and councils of the City of Columbus to make annual provisions for paying rentals to Thomas R. White, or his assignee, the Columbus Water Works Company, for future years, was and is null and void, because

there was nothing in the charter of the City of Columbus at
107 the time, which authorized the Mayor and Council to make such a contract nor were they authorized to do so by the qualified voters of said city.

Respondents aver that the holders of said bonds took the same with notice, first, of the want in authority of the Mayor and Council to bind subsequent Mayors and Councils by a contract of the character set forth; second, that even if said contract was valid, yet it was executory and was only binding upon the City of Columbus upon the faithful performance upon the part of the Columbus Water Works Company of the various obligations assumed by it under said contract; and third, that under said contract nothing would be due the water works by the city until the service was rendered, and whether the service was rendered is a question of fact depending upon the ability and good faith of the water works company.

Seventh. Respondents admit that in the year 1886, the corporate limits of the City of Columbus were extended northward and eastward, as alleged in 8th paragraph of the bill; they also admit that the Columbus Water Works Company has erected a standpipe in said annexed territory, and has laid pipes extending from said standpipe, but they deny that said improvements were made in a manner satisfactory and acceptable to the Mayor and Council of the City of Columbus. On the contrary the Mayor and Council of the City of Columbus endeavored to have said extensions made for at least ten years before they were made, during which time the people of
108 said territory were entirely without fire protection, and when the extensions were finally made and completed in the year 1900, the supply of water furnished by the Columbus Water Works Company was insufficient to supply the entire system, and even if the supply in the reservoir had been sufficient, the main which conducts the water from the reservoir to the city was too small to furnish the necessary water to the city, in consequence of which the work and service have proven very unsatisfactory and inefficient.

Eighth. Respondents admit to be true the allegations contained in the 9th paragraph of the bill, except that portion wherein it is alleged "that in many portions of the city on account of the property of the inhabitants, no permanent annual income on the extensions could be assured, yet the water works company has from time to time, waived this stipulated amount of annual income, and extended its mains wherever the City of Columbus has desired fire hydrants." This allegation is denied.

Ninth. Respondents deny as alleged in the 10th paragraph of the bill that "said contract was entered into by the City of Columbus with the full knowledge and full assent of the inhabitants composing and constituting said municipal corporation." Respondents can neither admit nor deny, for the want of sufficient information, that "public sentiment in favor of said contract was unanimous." They admit that the authority to make said contract was not submitted to the qualified voters of the City of Columbus, but they deny that it was not necessary so to do, and they deny that the Mayor
109 and Council of the City of Columbus were fully authorized to make said contract in all of its terms and to bind the City

of Columbus by all of its terms; and they deny that said contract is now a valid, legal and subsisting contract.

Tenth. Respondents deny "that the Columbus Water Works Company has used all of the income of said corporation over and above the sum required to meet the interest on its bonds in making improvements on said water works system."

They admit that the bridge at 14th street was swept away as alleged, and that the pipes bringing the water to the city were swept away. They deny the allegations in reference to submerged mains. They admit the other allegations contained in the 11th paragraph of the bill, except the allegation that ample water was supplied the city for fire protection by putting into operation a pumping system, which is denied.

Eleventh. Respondents deny that the Mayor and Council of the City of Columbus, in making said contract, afforded to their constituency ample opportunity to object to carrying out said contract. They admit that they did not act hastily but investigated the plans of different systems and that the contract was published, as alleged; but they deny that "every citizen taxpayer and inhabitant accepted the contract as the authorized act of the City of Columbus." They admit the incorporation of the water works company, as alleged; also of the construction of the system of water works; but
110 they deny that it was constructed in accordance with the specifications and requirements of the contract. They deny that, after being tested, it was found to be fully up to the contract requirements and satisfactory in every particular. They deny that "from the date of said acceptance the said company has continued to maintain and operate said system of water works in full compliance with said contract, and has furnished to the City of Columbus free and unrestricted use of its water for protection against fire, in accordance with its contract, and in every respect has fulfilled and met, observed, kept and performed all of the obligations resting upon it under and by virtue of said contract."

Respondents admit that the City of Columbus has from November, 1882, used the water of said company for fire protection and for preventing the spread of conflagrations, but the respondents say that the service rendered the city by the said water works company has for a large portion of said time fallen far short of that promised under said contract, as will hereinafter be more fully set forth.

Respondents admit that the inhabitants of the City of Columbus did not protest or object to the building of the water works system by the said water works company, nor have they objected to an extension of the same; on the contrary, they, as well as the mayor and council of the City of Columbus would have been perfectly satisfied had the water works company carried out the contract in accordance with the terms thereof, and had the said Columbus
111 Water Works Company been as faithful and diligent in carrying out said contract according to the terms thereof by furnishing the city and inhabitants of the city with an ample supply of good and wholesome water, as the city and inhabitants have been patient, forbearing and suffering, no trouble or differences would

Twelfth. Respondents deny, as alleged in paragraph 13th of the

have arisen between the mayor and council of said city and said water works company.

bill, "that it was known and contemplated by said City of Columbus at the time of entering into said contract, that the money required to build said system of water works was to be raised in whole or large part by the issue and sale of the bonds of the Columbus Water Works Company, and that the rentals which the City of Columbus was to pay would constitute the source from which the bondholders were to be paid the interest on their bonds and from which a fund would be provided toward the ultimate payment of the same." And respondents say that the said system of water works as originally constructed was not built from the proceeds arising from the sale of bonds, nor was it necessary to issue bonds for the construction of the same, nor were bonds issued for that purpose.

And respondents deny that "bonds were issued and sold *bona fide* to an unsuspecting public," and deny that "by the provision of said contract whereby the city agreed to receive in payment of any taxes due the City of Columbus the due coupons of any bond issued by Thomas R. White, to an amount not exceeding the rental due by the City to him in any one year; and the coupons thus taken
112 shall be received by him as cash in payment of said rentals," that the city thereby invited persons to become purchasers of said bonds.

Thirteenth. Respondents deny that the bonds of the said Columbus Water Works Company, issued as contemplated by said contract, were issued and sold upon the faith that the City of Columbus would pay said rental annually, as by said contract it had promised to do. And respondents deny that "the proceeds of said bonds amounting to three hundred and ninety two thousand dollars were used in the construction of said system of water works." Respondents aver, upon information and belief, that the water works system as first constructed was built with the money subscribed by the stockholders of the Columbus Water Works Company, and without the issue and sale of any bonds whatever. That afterwards, to-wit: in 1888, the Columbus Water Works Company issued bonds to the amount of one hundred and fifty thousand dollars for the purpose of reimbursing its stockholders for the money subscribed and paid into the capital stock of said Columbus Water Works Company, and that thereafter, in the year 1890, H. H. Epping, T. M. Foley and others, purchased the stock of said company, and shortly thereafter, to-wit: in 1891, issued three hundred and twenty five thousand dollars of bonds, and with the proceeds thereof retired the one hundred and fifty thousand dollars of said bonds which had been issued in 1888, and the balance, or so much thereof as was necessary was used to reimburse the then stockholders for the amount they had
113 paid for the stock. And that the purchasers of said bonds knew, or could by the exercise of proper diligence have known, that said bonds were not issued and sold for the construction or extension of said water works, and that the said system was not worth the amount of said bonds.

At the time of the issuance of said bonds, and for some time prior

thereto, the service performed by the water works company was very inefficient and exceedingly unsatisfactory to the City of Columbus, of which the water works company had been repeatedly notified. As early as September, 1886, the mayor and council formally declared the water to be insufficient in supply and very unwholesome in quality, and called upon the water works company to correct the evils complained of, which the said company promised it would endeavor to do. From that time numerous and frequent complaints were made. In April, 1887, a committee from the City Council, accompanied by the then Superintendent of the water works Company, tested the pressure and found the same deficient and not in accordance with the requirements of the contract. The committee further found that the water works company had not faithfully complied with its contract, and upon this report the city declined to pay the water rentals which had accrued. Following this complaint, the water works company again promised to take immediate steps to remedy the defects pointed out, which, as usual, it utterly failed to do. The least diligence or investigation on the part of the
114 persons contemplating purchase of the bonds of the water works company would have disclosed the fact that the system was inadequate, the service inefficient, the quality of the water unwholesome, and the situation as a whole so unsatisfactory to the city of Columbus that the contract was at any time liable to be declared null and void and cancelled because of the failure on the part of the water works company to comply with the obligations thereof.

Fourteenth. Respondents deny that said contract was entered into by the city authorities by and with the consent of the citizens of said city, excepting that, as hereinbefore stated, both the city and its citizens desired an adequate and satisfactory system of water works, and would have been, and would be now, perfectly content had the water works company faithfully performed the obligations assumed by it under said contract. Respondents submit that no question of estoppel by reason of acquiescence is involved in this case, inasmuch as the water works company chose to deal with the city authorities by express contract, and did not rely and could not have relied upon any acquiescence on the part of the citizens. The city has at all times faithfully performed its part of the contract; has paid liberally for all the water used and for the service rendered, although such water was frequently deficient in quantity and the service very unsatisfactory. The contract being executory in its nature and the city,
after long and patient indulgence, having become fully con-
115 vinced that the water works company can not and will not perform the service required of it under said contract, declines on its part to be bound to the performance of the obligations assumed by it.

Fifteenth. Respondents admit as true the allegations contained in the 16th paragraph of the bill as to the provisions of said contract, in reference to the exclusive privilege granted to the Columbus Water Works Company, and as to the privilege of the City of Columbus to purchase said water works, but respondents say that the mayor and council of the City of Columbus had no authority to

grant to the Columbus Water Works Company the exclusive privilege of maintaining and operating water works in said city, that the power to grant same is forbidden by the Constitution and laws of the State of Georgia. And respondents further say that the mayor and council of the City of Columbus had no authority to bind the City of Columbus conditionally or otherwise to purchase said system of water works after fifteen years, as provided in said contract, and said provision in said contract was and is invalid and of no force and effect whatever.

And respondents deny that under said contract, the mayor and council can not build or operate any water works system of its own, for its own use or for the use of others during the period mentioned in said contract, and they deny that said contract is still in force and is a binding and valid contract; but they say that even
115 if said contract was a valid contract when entered into by the respective parties, it has ceased to be binding upon the City of Columbus, for the reason that the said Columbus Water Works Company has repeatedly violated the terms and conditions of the same, as will hereinafter be more particularly set forth.

Respondents show that the City of Columbus has not revoked or attempted to revoke the franchise granted the water works company to construct, maintain and operate its system of water works, and for this purpose to use the streets of the city, nor has the city in any way or to any extent violated, or sought to violate the obligations of its contract. So long as the water works company rendered a service in any degree approximating that required of it, the city faithfully performed all of its obligations and made payment for all the service rendered to it, and even now, after conditions have become intolerable, and it had become perfectly manifest that the water works company can not afford an adequate supply of wholesome water the city continues to receive and pay for water and will continue to pay for the same so long as it takes and uses the water. It has declared and again declares that the contract being executory is terminated because of repeated violations thereof on the part of the water works and its demonstrated inability to comply in the future with the requirements of the contract.

117 Sixteenth. It is true that on the 14th day of September, 1902, the City Council of Columbus passed an ordinance providing for an election by the qualified voters of the City of Columbus to be held on December 4th, 1902, to determine whether the city should issue two hundred and fifty thousand dollars of bonds for the purpose of constructing, maintaining and operating a system of water works, but it is denied that the avowed purpose of furnishing water to private parties in competition with the Columbus Water Works Company was expressed in the ordinance. Respondents show that said ordinance was predicated upon express declaration therein contained that the Columbus Water Works Company had totally failed to supply the city and its inhabitants with a sufficient quantity of pure and wholesome water. In this emergency it became necessary for the city to take proper steps looking

to the preservation of the public health and to the furnishing of an adequate supply of water with pressure sufficient for the protection of property against fires. The ordinance contains no revocation of any right or franchise granted the Columbus Water Works Company, nor does it either avowedly, or in effect, in any wise impair the obligation of any contract.

It is true that the election as provided for in said ordinance was duly held and the proposition to issue said bonds for the purpose of erecting new water works by the city was overwhelmingly carried, there being only seven adverse votes out of a total vote of 1734, thus manifesting the practically unanimous desire of the citizens
118 of Columbus to escape from the evils inflicted upon them by the Columbus Water Works Company, and from which they had so long suffered. Respondents admit that pursuant to this vote bonds for the purpose of erecting new water works have been duly issued and the same have been validated by the courts of the State of Georgia in conformity with the statute in such case made and provided. Respondents further show that said bonds have been negotiated and sold, and that it is the purpose and intent of the city to devote the proceeds to the erection of a system of water works to be owned by the city.

It is denied that by its said action the city has in any way repudiated its contract with the Columbus Water Works Company in violation of the rights of complainant or any other person. It is again submitted that if the city should refuse to accept water from the Water Works Company, or to pay therefor, and if such refusal should be in violation of the contract the injured party or parties would have a complete and adequate remedy at law. It is further submitted that the city has both a legal and equitable right to provide and is charged with the high duty of providing for an adequate and wholesome supply of water for domestic and sanitary purposes and for fire protection, and that to this end it has the right to refuse to be further bound by the terms of an executory contract when it has been demonstrated that the other party has utterly failed to comply with its obligations and is unable to comply therewith. The Columbus Water Works Company being insolvent and all of its property and assets being in the hands of a receiver of this
119 court the water works company is unable to perform the contract even if it were otherwise able and willing so to do. Respondents further submit that the right of the city to issue bonds and provide for the erection of a system of water works depended upon conditions existing at the time the action was taken and prior thereto, and that nothing which may have subsequently occurred can affect the right of the city to stand upon the action then taken.

Seventeenth. In reply to the 18th paragraph of the bill respondents deny that there is any obligation on the part of the City of Columbus to purchase the said system of water works, and say that while the privilege of so doing was granted by the contract the city is under no obligation to avail itself thereof. It is denied that the building of the water works was supervised by a committee of coun-

cil and citizens appointed by the mayor and council and it is specifically denied, as hereinabove shown that the requirements of the city were fully complied with in the building of said water works. It is denied that the rights and franchise granted the water works company by said contract were to continue until the water works should be purchased by the City of Columbus. It is admitted that the city has made no offer, nor has it taken any proceedings for the purchase of said plant in accordance with the privilege afforded in said contract, it having become manifest that the system as a whole is utterly inadequate to afford the service demanded by the City of Columbus and its inhabitants.

120 It is denied that improvements have been made on said system in accordance with the terms of the contract and in accordance with the demands of the city and under the direction and supervision of the city authorities; on the contrary, it is averred that the water works company has utterly failed to extend and enlarge its system and make such improvements as were imperatively demanded by the increase in the growth of the city. The source of supply is utterly inadequate unless the water from the Chattahoochee River be resorted to. The conduit conveying the water from the reservoir to the city is only twelve inches in diameter as originally laid and has never been increased. Many of the mains in the city are laid with pipes of four inche diameter and contain numerous dead ends so that it will be impossible to deliver an adequate amount of water through the pipes and mains of the present system even should the source of supply be amply sufficient for that purpose. To provide an adequate system for the City of Columbus it will be necessary to abandon the present source of supply, to remove the present old and inadequate mains and pipes, and in effect to reconstruct and rebuild the entire system.

It is again denied that in providing for a new system of water works the city is disregarding the rights of complainant, or the holders of the bonds, or of the water works company; and it is denied that it is the intent and purpose of the city to render the system valueless, or to force the same to be operated at a loss, or to

121 deprive the water works company of its property without due process of law, or to disregard the contract rights of said company by pursuing a course subversive of the terms of the contract and of the good faith of the city. If there has been any lack of good faith, it is to be imputed to the course of the water works company in failing and refusing to observe the requirements of the contract and to afford the service required of it.

Eighteenth. Respondents specifically deny that the purpose of the city is to destroy the value of the water works property by withdrawing from the city revenues necessary to its existence. It specifically denies that it has intended or desired to force the said company to sell its plant to the city at such price as the city may name; on the contrary, for reasons herein above stated, and for other good and sufficient reasons, the city of Columbus has no desire to purchase said water works system at any price, nor could it accept and use said system because of its many defects and insufficiencies. When the

contract was entered into the water works company knew and was charged by law with the duty of knowing that if it failed or refused to comply with the obligations required of it under the contract and to at all times supply water of the quality and in the quantity and maintain the pressure demanded in the contract, the obligation of the other contracting party to take and pay for water and service would cease and be terminated.

122 Nineteenth. Respondents admit the filing of the bill by complainant against the Columbus Water Works Company and the appointment of William S. Greene as receiver under order of this Honorable Court, and that leave has been granted by the court to the receiver to issue fifty thousand dollars of receiver's certificates. It is denied that the same is amply sufficient to supply said city with all the water for all purposes that it can possibly need. The other allegations contained in paragraph 20 of the bill are neither admitted nor denied for the want of sufficient information.

Twentieth. Respondents deny that there is now due and unpaid to the Columbus Water Works Company the sum of twenty five hundred dollars by the City of Columbus, or that the city is indebted to the water works Co. in any sum. Respondents show that had the water works company complied with the terms and conditions of the contract there would have been due the sum of $2530.82 for the quarter ending the first day of October, 1902. Payment of the water rentals for this quarter was refused by the city because of the total failure of the Water Works Company to perform the service required of it under the contract. The source of water supply failed almost entirely and the very small amount that was delivered through the pipes was foul of odor, putrid, to the last degree, unwholesome, and utterly unfit for any domestic purposes. The citizens of the city were required to resort to the use of well water or purchase their drinking water from supplies brought in by private parties

123 from neighboring springs. So great was the lack of water that the fire pressure was utterly inadequate and practically destroyed. The water company resorted to the use of river water, obtaining the water from a point in the river within the city limits and within a short distance from the point where the city sewerage was discharged. This was mixed with a small quantity of water obtained from the reservoir, but to no appreciable extent improved the quality of the water, for that it was muddy and continued foul of odor and utterly unfit for domestic purposes. The conditions were intolerable and both the city and its citizens suffered from the evil consequences thereof. Respondents stated on information and belief that the receiver has applied to the court for leave to refund the amounts paid by such waters takers during this quarter as have made payment therefor, thereby fully recognizing the worthlessness of the service.

Twenty-first. Respondents take issue in law with the conclusions stated in the 22nd paragraph of the bill that unless the action of the City of Columbus be immediately restrained and prevented, irreparable injury and damage will result to the holders of the bonds of the Columbus Water Works Company. They can neither admit nor

deny, for want of sufficient information, that the Columbus Water Works Company has no property other than its plant and
124 its contract with the City of Columbus, or the rentals stipulated to be paid by the city, and the revenues derived from private consumers, wherewith to meet its operating expenses and make payment of interest on its bonds. Respondents can not say whether under the administration of its affairs, the water works company had expended in operating expenses the greater portion of its revenue derived from private consumers, or that without the water rentals from the City of Columbus it would be unable to pay the interest on its bonds. But respondents are impressed with the belief that the revenue derived from private consumers of the water should under an economical and careful management yield more than enough to pay operating expenses and necessary fixed charges based upon the value of the plant, provided the water works company can and will furnish a proper service. As to these matters, however, the respondents submit that they in no way concern the issues involved in the case. It is doubtless true that if the water works company has no sufficient revenue to meet its operating expenses and necessary fixed charges, its water works plant would become of little value from a financial standpoint; and it is admitted that its mains, machinery and material are of such age and character and so situated as to be of comparatively little value should the plant be dismantled and the materials removed.

Respondents submit that whether the City of Columbus could support two water works systems is a matter of conjecture, and
125 that the statements contained in the bill bearing upon the question are argumentative and need not be further answered.

Twenty-second. Respondents are not informed as to who are the owners of the water works company's bonds and demand strict proof of ownership. They deny that it is impracticable for the holders of the bonds to take steps for their own protection, and they submit that the trustee has neither duty nor right to institute and maintain this suit without consultation with and appropriate request from the holders of the bonds, if indeed it would have any right at all. It is denied that the trustee can of its own volition maintain this suit.

Twenty-third. Respondents deny the assumption of fact contained in the opening clause of the 24th paragraph of the bill. They deny that the water works company has complied with the terms and conditions of its contract, and they deny that the City of Columbus or the General Assembly of the State of Georgia by the Act of December 3rd, 1902, or in any other way, has attempted to impair the obligation of said contract. They deny that the city has deprived the bondholders of the rental to be paid to it under said contract, and that said action and threatened action are in fraud and destruction of the rights of the bondholders, or any other persons, or denies to them the protection guaranteed to them by the Constitution of the United States.

126 It is denied that the action of the city in adopting the ordinance ordering an election to determine whether water bonds should be issued for the purpose of erecting water works or

that the carrying of said election in favor of the proposition by more than the requisite two thirds of the qualified voters of said city, or that the action of the city declaring the result of said election, or that any subsequent conduct on the part of the city of Columbus in giving effect to said ordinance, are attempts on the part of said city to impair the obligations of the contract in violation of the Constitution of the United States, or that they constitute an effort to do so, or that any action or conduct on the part of said city deprived or seeks to deprive the complainant or any other person of any right of property without due process of law, or constitute a denial as to them of the equal protection of the laws, or in any wise violate any right they or either of them may have.

It is respectfully submitted that the present suit presents no federal question and that this court as a court of the United States as well as a court of equity, is without jurisdiction of the controversy. It is submitted that a declaration on the part of the city that it will not be held further liable under an executory contract because of the utter failure and refusal of the other contracting party to comply with the terms and conditions of the contract required of it in no wise impairs the obligation of any contract but constitutes a simple denial of further liability thereunder, conceding the contract
127 to be valid and binding if performed by the other party according to its terms and stipulations; and even should the city refuse to accept the service and make the payments stipulated and it should be determined that it had no right so to do such action on its part would constitute merely a breach of the contract and not any impairment of its obligation.

Twenty-third. The allegations of fact contained in the 25th and 26th paragraphs of the bill are denied, and issue in law is tendered to the conclusions therein stated.

For further cause why an injunction should not be granted as prayed for, respondents say:

The Mayor and Council of the City of Columbus entered into said contract with Thomas R. White and the Columbus Water Works Company in good faith, the consideration moving said mayor and council being to secure to the city and to the inhabitants thereof an ample supply of good and wholesome water for domestic use and for protection against fire.

The said Thomas R. White and the Columbus Water Works Company assured the Mayor and Council that they were able and would undertake and guarantee that "the supply of water both in quality and amount shall be wholesome, constant and amply sufficient to meet the wants of the city and private consumers for future and present requirements." Relying upon this guarantee and other obligations of said Thomas R. White, which are set forth in the con-
128 tract, the mayor and council agreed to the terms thereof.

The Columbus Water Works Company, the successor and assignee of said White, failed to construct the water works system as prescribed in said contract, as *has* hereinbefore set forth, but notwithstanding these failures to comply with the terms and stipulations of said contract, the Mayor and council being assured by the water works company that the supply was ample and the filter pro-

vided was better than the one provided in the contract, and further relying upon the guarantee that the system would be maintained and if necessary changed to meet the requirements of the city and its inhabitants, accepted the work.

Respondents further show that shortly after the system of water works was put in operation and private consumers began to take and use the water, it was demonstrated that the system was defective. It was discovered that the conduit or main which conveyed the water from the reservoir to the city mains was too small, and in cases of fire failed to furnish the mains in the city with such quantity as to maintain the pressure required. The mains in the city and especially the four and six inch mains were inadequate to furnish a sufficiency of water and of required pressure to put out and prevent the spread of fires. In the laying of distributing mains instead of providing for a circuit of water in the mains, a large number of dead ends to the pipes were maintained, the consequence of which is, in cases of fires when the water is sorely needed, only about one half of the
129 supply and pressure is afforded from those pipes having dead ends.

The filter was soon abandoned as worthless and the company failed and refused to supply another, and the consequence was that the pipes were frequently obstructed with mud, trash, leaves, and in many instances fish, both dead and alive, were found in the mains, and the water was discolored and frequently muddy and unfit for domestic use. It frequently occurred during seasons of dry weather that very little if any water flowed into the reservoir, and in such cases the water that had accumulated in the reservoir would become stagnant, impure and wholly unfit for drinking purposes.

The water works company failed to construct and maintain the reservoir for storage of water as provided in Article XII of the contract, the result of which was that in seasons of dry weather it failed to furnish a sufficient supply and the quality was unwholesome and unfit for domestic and drinking purposes. It is provided in Article XII of the contract "in constructing the storage reservoir, all trees, stumps, roots, grass, alluvial deposits vegetable and unwholesome matter shall be removed from the space to be occupied by the water. Excavations and embankments shall be made about the margins of the reservoir such as will avoid all thin edges to the water, with reservoir filled, and cause marginal depths of not less than four feet of water." In constructing the reservoir the company failed to comply with this obligation, but left large quantities of alluvial
130 deposits and vegetable and unwholesome matter on the space to be occupied by the water, and failed to avoid all thin edges to the water and failed to cause marginal depths of not less than four feet; on the contrary, for a large part of the reservoir the marginal depths were only a few inches and the water was allowed to run out on thin or feather edges exposing it to the rays of the sun and causing it to become impure and unwholesome.

It is further provided in said paragraph that "after the completion of the reservoir, and the use of the water from the same by the city it shall be kept free from grass, mud, vegetation of all kinds,

aquatic or otherwise, and all proper and reasonable provisions made for cleanliness and purity. The filtering material surrounding the supply main shall be kept in good condition and cleanly."

The water works company has failed in every respect to comply with this provision of the contract, grass, weeds, vegetation of various kinds, aquatic and otherwise, have been allowed to grow in and on the margins of said reservoir, and no provisions whatever have been made for cleanliness and purity; on the contrary said reservoir has been suffered to become filthy, noxious and impure, and as before stated the filter and filtering material *was* wholly abandoned in a short time after the system was built and no efforts were made to provide another filter until a few months prior to the filing of the bill by complainants and this was done by the receiver.

131 Respondents further show that by reason of the fact that the waterworks company failed to furnish water in sufficient quantity, much property has been from time to time destroyed by fire, the aggregate amount in value of such property as has been destroyed and which would have been saved had an adequate supply of water been furnished, would in the opinion of respondents — been largely more than enough to build a first class system of water works for the City of Columbus.

Respondents show that in the year 1886, the limits of the City of Columbus were extended, taking in a considerable territory which was thickly settled with inhabitants, the people of this new territory were without fire protection, and at the same time were taxed to help pay the water works company for the annual rents of hydrants. Efforts were then made and continued to be made to induce the water works company to extend its mains and furnish water to said territory, but without effect, until in the year 1898 they began, and did by April 1900 extend its mains to a portion of the territory, but the service rendered by it was far from satisfactory as to quantity and quality of water furnished, as well as in the pressure for fire protection.

Respondents further show that it has been known by the water works company for many years that their supply of water was inadequate, that in many seasons of dry weather the reservoir was well nigh exhausted, and on three occasions, to-wit: in the Fall of the years 1895 and 1898, the upper or storage reservoir was entirely exhausted of water, and in the summer and fall of the year

132 1902, their supply entirely failed. Complaint was made to them by the mayor and council and citizens repeatedly, beginning with the year 1886, and in almost every year since that time of the defective service, and its attention was called repeatedly to the following particulars wherein they had failed to comply with their contract, to-wit: (1) that the conduit leading from the reservoir to the city was too small; (2) that the mains in the city and especially the four inch mains were entirely inadequate; (3) that the dead ends should be abandoned; (4) that there was insufficient pressure; (5) that the water was unfit for domestic use, that it was muddy, trashy, had a noxious odor, and at times had a large number of dead fish in the reservoir; (6) that the storage reservoir was of less ca-

pacity than required by the contract, and that it was not kept as required; (7) that they had not provided a filter as required by the contract.

The water works company has further utterly failed to extend and improve its system so as to keep pace with the growth of the city and the increased demands for water as by the contract it was required to do. At the time the contract was entered into the City of Columbus contained only ten thousand inhabitants, when it was provided that the water supply main should be of twelve inch internal diameter and the distributing system of the city should consist of five miles of street mains. These specifications were made for original construction with the understanding and agreement that the capacity should be increased as changed conditions might require.

Columbus has now a population of over twenty thousand in-
133 habitants and the distributing system extends over twenty three miles, notwithstanding which said water works company has never increased its supply mains, nor has it made adequate provision for the increased distributing system, notwithstanding that the contract requires that the supply main shall be of ample capacity and the size of the street mains shall be ample for supply to consumers and for fire protection, and further provides that the work shall be built on such a scale as shall permit the extension of pipes and the enlarged supply for the future without remodeling or altering the machinery or street mains for many years to come under ordinary conditions.

Notwithstanding the complaints and remonstrances of the Mayor and Council of the City of Columbus and of the inhabitants of the city and of the warnings which they had received during the dry years since 1886, and especially of the years of 1895 and 1898, when the reservoir dried up, the said water works company turned a deaf ear to all efforts made to induce them to comply with their contract.

Respondents further show that the water works company in 1895 and at other times claimed that it had other sources of water supply in the State of Alabama and near their reservoir, which added to what they were using would afford an ample supply, and promised that they would build other reservoirs so as to utilize said water, but they failed to carry out their promise.

134 Finally, in the year 1902, the water supply of said water works company entirely failed, and the inhabitants of the City of Columbus were entirely deprived of water for domestic purpose from said company, and were forced to resort to other sources, such as from wells and the purchasing of water from parties owning springs outside of the city limits, and which was hauled into the city by wagons.

Confronted with this state of affairs, and apprehensive that an epidemic of disease and death might be visited upon the inhabitants of the city at sometime unless an abundant supply of wholesome water was provided, and considering the fact that th- city was rapidly increasing in population, and would need more water than had ever been needed or used in the past, the mayor and council of the city believed that they would be unfaithful to the inhabitants if they

failed to take steps to provide for a water supply from some other source than the Columbus Water Works Company.

Whereupon, an ordinance was passed submitting to the voters of the city the question as to whether or not the city should issue bonds with the proceeds of which to build a system of water works to be owned and operated by the City of Columbus. Books for registration were opened and voters registered, an election was held on the 4th of December, 1902, when all of those registered voted except 87 and of these 1640 voted for bonds and only seven against bonds.

Afterwards, to-wit: on the 8th day of August, the mayor and
135 council having previously provided for the issue of two hundred and fifty thousand dollars of bonds, the same *was* sold, and with the proceeds it is the purpose of said city to build and own a system of water works for the city and its inhabitants.

And for special cause why a preliminary injunction or *ad interim* injunction should not be granted pending an adjudication of the controversy on its merits, these respondents show that the balance of convenience is decidedly in favor of the city. Should the injunction be granted and the city finally prevailed in its contentions and it should be adjudicated that it has the right to construct and operate its system of water works, the injury and damage which in the mean time would have resulted to the city and its inhabitants, would be irreparable for that the water works company is insolvent and the injury would be incapable of pecuniary estimation. If on the other hand the complainant should finally prevail its damages, if any could be easily ascertained by reference to the contract, and the city being entirely solvent would be able to respond to any judgment recovered against it; and in the meantime the water works company, or the receiver thereof, would continue to operate the property and receive the revenues therefrom. The bonds of the city have been voted, validated and sold; it would require a considerable length of time,

perhaps several years for the city to construct its own system
136 of water works; and if it should be eventually declared that the city could not rightfully maintain and operate such water works, an injunction at that time would be equally as effective as if granted sooner.

Wherefore, these respondents pray that the rule against them be dismissed, and that they may be hence discharged with their reasonable costs in this behalf incurred.

T. T. MILLER,
J. H. MARTIN,
ELLIS, WIMBISH & ELLIS,
Solicitors for Respondents Named.

T. T. MILLER,
J. H. MARTIN,
W. A. WIMBISH,
Of Counsel.

STATE OF GEORGIA, *County of Muscogee:*

In person appeared before the undersigned L. H. Chappell who being duly sworn deposes and says: that he is the Mayor of the City of Columbus, one of the respondents named in the foregoing re-

sponse, that he has read said response and knows the contents thereof, and that the facts therein stated are true, excepting that facts stated upon information and belief he verily believes to be true.

L. H. CHAPPELL.

Sworn to and subscribed before me this September 15th, 1903.

[SEAL.] A. W. COZART,
Notary Public, Muscogee Co., Ga.

137 *Appearances of Counsel for City of Columbus et al.*

Entered and Filed 5th Day of Sept., '03.

In the Circuit Court of the United States for the Northern District of Georgia, Western Division. In Equity.

September Rules, 1903.

MERCANTILE TRUST & DEPOSIT COMPANY OF BALTIMORE, Trustee, Complainants,
vs.
THE CITY OF COLUMBUS ET AL., Respondents.

To O. C. Fuller, Clerk U. S. Circuit Court:

You will please enter our appearance for respondents, other than the Columbus Water Works Co., in the above stated case.

At Columbus, Ga., this fifth day of September, 1903.

T. T. MILLER,
J. H. MARTIN,
ELLIS, WIMBISH & ELLIS,
Solicitors for Respondents.

T. T. MILLER,
Columbus, Ga.,
J. H. MARTIN,
Columbus, Ga.,
W. A. WIMBISH,
525 *Prudential Building, Atlanta, Ga.,*
Of Counsel.

138 No. 59. Entered and filed this 5th day of September, 1903.

O. C. FULLER, *Clerk,*
By N. A. BROWN, *Deputy.*

139 *Order Setting Hearing of Demurrer.*

In the Circuit Court of the United States for the Northern District of Georgia, Western Division.

No. 59. In Equity.

MERCANTILE TRUST & DEPOSIT COMPANY OF BALTIMORE
vs.
THE CITY OF COLUMBUS ET AL.

Bill.

Upon motion of counsel for defendants named in the above entitled cause (other than Columbus Water Works Company),

It is ordered, That the demurrer filed to the original bill by the said defendants be set down for hearing at the City of Atlanta, Georgia, on Monday, September 28th, 1903, at ten o'clock in the forenoon, or so soon thereafter as counsel can be heard.

Dated and signed at Atlanta, Georgia, this 18th day of September, 1903.

WM. T. NEWMAN,
U. S. Judge.

Service acknowledged and copy waived.

J. PACKARD.
HALL & WIMBERLY.
L. F. GARRARD.

September 19, 1903.

Filed in clerk's office 18 day of Sept., 1903.

O. C. FULLER, *Clerk.*

140 *Answer of City of Columbus and Mayor and Aldermen of said City.*

Filed October 5/03.

No. 59. In Equity.

In the Fifth Circuit Court of the United States for the Northern District of Georgia, Western Division.

MERCANTILE TRUST & DEPOSIT CO. OF BALTIMORE
vs.
CITY OF COLUMBUS ET AL.

Bill.

Answer of defendants, the City of Columbus and of the Mayor and Aldermen of said City.

These defendants respectively, without waiving their demurrer heretofore filed in this cause but wholly relying thereon; and now

and at all times saving to themselves any and all manner of benefit or advantage of exception or otherwise that can or may be had or taken to the many errors, uncertainties and imperfections in the said bill contained, for answer thereto or to so much thereof as these defendants are advised it is material or necessary for them to make answer to, severally answering, say:

First. It is admitted that the corporate character and citizenship of the separate parties are correctly set forth in the original bill; but it is denied that the individual defendants named as mayor and aldermen of the City of Columbus have any interest in the
141 controversy, or are proper parties to the cause, the corporate name of the city being "The City of Columbus," in which name it is authorized by law to sue and be sued.

Second. Respondents do not deny that the Columbus Water Works Company issued the bonds and secured the same by mortgage or deed of trust and created the plaintiff as trustee, as is alleged in the first paragraph of the bill; but they are without information further than from the allegations of the bill regarding due execution and issuance of said bonds and deed, or of the number of bonds that have been delivered, or of the number now in the possession of the receiver of this court, and these respondents demand strict proof of the allegation that 392 of said bonds are now outstanding and held by persons who purchased the same in open market for value.

Third. Respondents deny that said bonds were issued and sold by the Columbus Water Works Company in order to raise money wherewith to construct, equip and complete a system of water works for the purpose of carrying out its contract with the City of Columbus and on the contrary say that said bonds were not issue- until nine years after the water works system was constructed. Respondents are informed and believe that no bonds were originally issued for the purpose of constructing the system of water works, and not until 1888 did the water works company issue bonds, and that the bonds then issued amounted in the aggregate to $150,000.00 Re-
142 spondents state upon information and belief that the purpose for which said bonds were issued was not in order to construct, equip and complete a system of water works in accordance with the contract with the city, but that said bonds so issued in 1891 were used for the purpose of retiring the previous issue of 1888, and for the payment of dividends to stockholders of the Columbus Water Works Company, and for other purposes; that only the proceeds of a small number of said bonds have been used in extending, repairing or equipping the system of water works; that the entire cost of the water works system, including all moneys that have been spent thereon since its original construction, is very much less than $392,000.00, and that said system does not represent a cost or value of any such sum of money.

Fourth. It is true that under date of October 21st, 1882, the Columbus Water Works Company by its president submitted a communication to the mayor and council of the City of Columbus, stating that in accordance with the contract it had completed the system of water supply for the city, and that the water was then ready for dis-

tribution and use. On November 6th, 1882, this communication was considered by the Mayor and council and it was stated that the filters of the reservoir differed from those prescribed in the contract. Whereupon assurance was given by the water works company that the filter built was an improvement upon the one called for in the contract. Acting upon this assurance and upon the further
143 assurance of the water works company that the system had been completed in accordance with the terms and requirements of the contract, as will be further shown and explained hereinafter, the mayor and council of the city adopted a resolution accepting the same as appears from Exhibit C attached to the bill. Respondents deny that the system was completed in accordance with the requirements of the contract in the following particulars:

1. The water works company failed to provide a storage reservoir for water, having an available capacity for the storage and supply of not less than one hundred and twenty five million gallons of water when filled, as required by Article III of the contract, but instead thereof provided a reservoir having an available capacity or not more than forty million gallons of water. The capacity of said reservoir was not known to the mayor and council of the City of Columbus at the time said work was accepted, and was not known until in the year 1893, when, on account of the scarcity of water the mayor and council had a survey and measurements made of the reservoir, and thereby ascertained the capacity thereof.

2. The water works company failed to provide street mains of such sizes as would afford an ample supply of water to consumers and for fire protection, as provided in Article IX of the contract. At the time of the acceptance of the work, there was no way by which the mayor and council of the City of Columbus could ascer-
144 tain*ed* if the street mains were of sufficient sizes for the purpose intended, as there were no private consumers of water from the water works company and no fire had occurred to demonstrate the capacity of the mains, and reliance was therefore had upon the assurance of the water works company that the sizes of said street mains were ample to supply water as provided in the contract.

3. The water works company failed to provide a filter for water distribution as provided in Article XI of the contract, and while it admitted that the filter of the reservoir differed from the one prescribed in the contract, the Mayor and Council were assured that the one built was an improvement on the one described in the contract for the reason that it could be easily taken out and cleaned, when in truth and in fact the filter provided proved to be of no value whatever and was abandoned entirely in a short while after the water works was completed.

4. The water works company failed to construct the storage reservoir as provided in Article XII of the contract, in that stumps, roots, alluvial deposits, vegetable and unwholesome matter were not removed, but were allowed to remain in the reservoir, nor were thin edges to the water avoided by the making of excavations and embankments along the margin of the reservoir, as provided, but around

the greater portion of the reservoir there were no excavations
145 made and the water was allowed to stand at thin or feather edges, the consequence of which was that the water became unwholesome and impure in seasons of dry weather.

Fifth. The allegations contained in paragraph 6th of the bill are substantially true.

Sixth. Respondents admit that the Mayor and Council of the City of Columbus did agree and promise by Article XV of said contract that "in order to make provisions for the payment of water rents, the mayor and council, in making appropriations for the fire and sanitary departments, shall appropriate a sum sufficient to pay the annual rental of the water works, and the mayor and council shall receive in payment for any taxes due the City of Columbus the due coupons of any bond issued by Thomas R. White, to an amount not exceeding the rental due by the city to him, in any one year, and the coupons thus taken shall be received by him in cash payment for said rentals," but respondents deny that said article of said contract was entered into on account of the "great anxiety of the people of Columbus" and they further deny that the agreement on the part of the city to receive due coupons for any taxes due the City of Columbus constituted an element of credit in the sale of the bonds, or was very valuable thereto, or enabled the water works company to sell the bonds at a better price than it otherwise would have obtained. Respondents submit that the agreement was simply an arrangement under which instead of paying the rentals due
146 *pro tanto* directly to the water works company, the city consented to accept the due coupons in payment of obligations due to it by way of taxes, which was the equivalent of saying that payment should be made directly to the water works company or to the holders of the coupons of its bonds to the extent limited. In either case the credit of the city was pledged to the extent of the annual rentals due, and no further. Respondents can not admit, and therefore deny, that said bonds have passed into the hands of innocent holders for their full market value, and that said holders obtained said bonds relying to any greater degree upon the special provision for accepting due coupons in payment of taxes than upon faith that the city would perform the obligations of its contract generally. And respondents submit that said Article XV of said contract, in so far as it sought to bind succeeding mayors and councils of the City of Columbus to make annual provision for paying rentals to Thomas R. White, or his assignee, the Columbus Water Works Company, for future years, was and is null and void, because there was nothing in the charter of the city of Columbus at the time which authorized the mayor and council to make such a contract, nor were they authorized to do so by the qualified voters of said city.

Respondents aver that the holders of said bonds took the same with notice, first, of the want in authority of the mayor and council to bind subsequent mayors and councils by a contract of the char-
acter set fort- second; that even if said contract was valid, yet
147 it was executory and was only binding upon the City of Columbus upon the faithful performance on the part of the Columbus Water Works Company of the various obligations assumed

by it under said contract; and third, that under said contract nothing would be due the water works by the city until the service was rendered, and whether the service was rendered is a question of fact depending upon the ability and good faith of the water works company.

Seventh. Respondents admit that in the year 1886, the corporate limits of the City of Columbus were extended northward and eastward as alleged in the 8th paragraph of the bill; they also admit that the Columbus Water Works Company has erected a standpipe in said annexed territory, and has laid pipes extending from said standpipe, but they deny that said improvements were made in a manner satisfactory and acceptable to the Mayor and Council of the City of Columbus. On the contrary, the mayor and council of the City of Columbus endeavored to have said extensions made for at least ten years before they were made, during which time the people of said territory were entirely without fire protection, and when the extensions were finally made and completed in the year 1900, the supply of water furnished by the Columbus Water Works Company was insufficient to supply the entire system, and even if the supply in the reservoir had been sufficient, the main which conducts the
148 water from the reservoir to the city was too small to furnish the necessary water to the city, in consequence of which the work and service have proven very unsatisfactory and inefficient.

Eighth. Respondents admit to be true the allegations contained in the 9th paragraph of the bill, except that portion wherein it is alleged "that in many portions of the city on account of the poverty of the inhabitants, no permanent annual income on the extensions could be assured, yet the water works company has, from time to time, waived this stipulated amount of annual income, and extended its mains wherever the City of Columbus has desired fire hydrants." This allegation is denied.

Ninth. Respondents deny as alleged in the 10th paragraph of the bill that "said contract was entered into by the City of Columbus with the full knowledge and full assent of the inhabitants composing and constituting said municipal corporation." Respondents can neither admit nor deny, for want of sufficient information that "public sentiment in favor of said contract was unanimous." They admit that the authority to make said contract was not submitted to the qualified voters of the City of Columbus, but they deny that it was not necessary to do so, and they deny that the mayor and council of the City of Columbus were fully authorized to make said contract in all of its terms, and to bind the city of Columbus by all of its terms; and they deny that said contract is now a valid, legal and subsisting contract.

149 Tenth. Respondents deny "that the Columbus Water Works Company has used all of the income of said corporation over and above the sum required to meet the interest on its bonds in making improvements on said water works system."

They admit that the bridge at 14th Street was swept away as alleged, and that the pipes bringing the water to the city were swept away. They deny the allegations in reference to submerged mains.

They admit the other allegations contained in the 11th paragraph of the bill, except the allegation that ample water was supplied the city for fire protection by putting into operation a pumping system, which is denied.

Eleventh. Respondents deny that the Mayor and Council of the City of Columbus, in making said contract afforded to their constituency ample opportunity to object to carrying out said contract. They admit that they did not act hastily but investigated the plans of different systems and that the contract was published as alleged, but they deny that "every citizen taxpayer and inhabitant accepted the contract as the authorized act of the City of Columbus." They admit the incorporation of the water works company, as alleged; also of the construction of the system of water works; but they deny that it was constructed in accordance with the specifications and requirements of the contract. They deny that, after being tested, it was found to be fully up to the contract requirements and satisfactory in every particular. They deny that "from the date of said acceptance the said company has continued to maintain and operate
150 said system of water works in full compliance with said contract, and has furnished to the City of Columbus free and unrestricted use of its water for protection against fire, in accordance with its contract, and in every respect has fulfilled and met, observed, kept and performed all of the obligations resting upon it under and by virtue of said contract."

Respondents admit that the City of Columbus has from November, 1882, used the water of said company for fire protection and for preventing the spread of conflagrations, but the respondents say that the service rendered the city by said water works company has for a large portion of said time fallen far short of that promised under said contract, as will hereinafter be more fully set forth.

Respondents admit that the inhabitants of the City of Columbus did not protest or object to the building of the water works system by the said water works company, nor have they objected to an extension of the same; on the contrary, they, as well as the mayor and council of the City of Columbus, would have been perfectly satisfied had the water works company carried out the contract in accordance with the terms thereof, and had the said Columbus Water Works Company been *has* faithful and diligent in carrying out said contract according to the terms thereof by furnishing the city and inhabitants of the city with an ample supply of good and wholesome water, as the city and inhabitants have been patient, forbearing and
151 suffering, no trouble or differences would have arisen between the mayor and council of the city and said water works company.

Twelfth. Respondents deny, as alleged in paragraph 13th of the bill "that it was known and contemplated by said City of Columbus at the time of entering into said contract, that the money required to build said system of water works was to be raised in whole or in part by the issue and sale of the bonds of the Columbus Water Works Company, and that the rentals which the City of Columbus was to pay would constitute the source from which the bondholders were to

be paid the interest on their bonds and from which a fund would be provided toward the ultimate payment of the same." And respondents say that the said system of water works as originally constructed was not built from the proceeds arising from the sale of bonds, nor was it necessary to issue bonds for the construction of same, nor were bonds issued for that purpose.

And respondents deny that "bonds were issued and sold *bona fide* to an unsuspecting public" and deny that "by the provision of said contract whereby the city agreed to receive in payment of any taxes due the City of Columbus the due coupons of any bond issued by Thomas R. White, to an amount not exceeding the rental due by the City to him in any one year; and the coupons thus taken shall be received by him as cash in payment of said rentals," that the city thereby invited persons to become purchasers of said bonds.

Thirteenth. Respondents deny that the bonds of the said
152 Columbus Water Works Company, issued as contemplated by said contract were issued and sold upon the faith that the City of Columbus would pay said rental annually, as by said contract it had promised to do. And respondents deny that "the proceeds of said bonds amounting to three hundred and ninety-two thousand dollars were used in the construction of said system of water works." Respondents aver, upon information and belief, that the water works system as first constructed was built with the money subscribed by the stockholders of the Columbus Water Works Company, and without the issue and sale of any bonds whatever. That afterwards, to wit: in 1888, the Columbus Water Works Company issued bonds to the amount of one hundred and fifty thousand dollars for the purpose of reimbursing its then stockholders for the money subscribed and paid in to the capital stock of said Columbus Water Works Company, and that thereafter, in the year 1890, H. H. Epping, T. M. Foley, and others, purchased the stock of said company, and shortly thereafter, to-wit: in 1891, issued three hundred and twenty five thousand dollars of bonds, and with the proceeds thereof retired the one hundred and fifty thousand dollars of said bonds which had been issued in 1888, and the balance, or so much thereof as was necessary was used to reimburse the then stockholders for the amount they had paid for the stock. And that the purchasers of said bonds knew, or could by the exercise of proper diligence have known, that said bonds were not issued and sold for the construction or extension of said water works, and that the said system was not worth
153 the amount of said bonds.

At the time of the issuance of said bonds, and for sometime prior thereto, the service performed by the water works company was very inefficient and exceedingly unsatisfactory to the City of Columbus, of which the water works company had been repeatedly notified. As early as September, 1886, the mayor and council formally declared the water to be insufficient in supply and very unwholesome in quality and called upon the water works company to correct the evils complained of, which the said company promised that it would endeavor to do. From that time numerous and frequent complaints were made. In April, 1887, a committee from the City Council accompanied by the then superintendent of the water

work- company, tested the pressure and found the same deficient and not in accordance with the requirements of the contract. The committee further found that the water works company had not faithfully complied with its contract, and upon this report the city declined to pay the water rentals which had accrued. Following this complaint, the water company again promised to take immediate steps to remedy the defects pointed out, which, as usual, it utterly failed to do. The least diligence or investigation on the part of persons contemplating purchase of the bonds of the water works company would have disclosed the fact that the system was inadequate the service inefficient, the quality of the water unwholesome and the situation, as a whole, so unsatisfactory to the City of Columbus that the contract was at any time liable to be declared null and void and cancelled because of the failure on the part of the water works company to comply with the obligations thereof.

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Fourteenth. Respondents deny that said contract was entered into by the city authorities by and with the consent of the citizens of said city, excepting that, as hereinbefore stated, both the city and its citizens desired an adequate and satisfactory system of water works, and would have been, and would be now, perfectly satisfied had the water works company faithfully performed the obligations assumed by it under the contract. Respondents submit that no question of estoppel by reason of acquiescense is involved in this case, inasmuch as the water works company chose to deal with the city authorities by express contract, and did not rely and could not have relied upon any acquiescence on the part of the citizens. The city has at all times faithfully performed its part of the contract; has paid liberally for all the water used and for the service rendered, although such water was frequently deficient in quantity and the service very unsatisfactory. The contract being executory in its nature and the city, after long and patient indulgence, having become fully convinced that the water works company can not and will not perform the service required of it under said contract, declines on its part to be bound to the performance of the obligations assumed by it.

Fifteenth. Respondents admit as true the allegations contained in the 16th paragraph of the bill as to the provisions of said contract in reference to the exclusive privilege granted to the Columbus Water Works Company, and as to the privilege of the City of Columbus to purchase said water works, but respondents say that the mayor and council of the City of Columbus had no authority to grant to the Columbus Water Works Company the exclusive privilege of maintaining and operating water works in said city, that the power to grant the same is forbidden by the Constitution and laws of the State of Georgia. And respondents further say that the mayor and council of the City of Columbus had no authority to bind the City of Columbus conditionally or otherwise to purchase said system of water works after fifteen years, as provided in said contract, and said provision in said contract was and is invalid and of no force and effect whatever.

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And respondents deny that under said contract, the mayor and council can not build or operate any water works system of its own,

for its own use or for the use of others during the period mentioned in said contract, and they deny that said contract is still in force and is a binding and valid contract; but they say that even if said contract was a valid contract when entered into by the respective parties, it has ceased to be binding upon the City of Columbus, for the reason that the said Columbus Water Works Company has repeatedly violated the terms and conditions of the same.

Respondents show that the City of Columbus has not revoked or attempted to revoke the franchise granted the water works company to construct, maintain and operate its system of water works,
156 and for this purpose to use the streets of the city, nor has the city in any way or to any extent violated or sought to violate, the obligations of its contract. So long as the water works company rendered a service in any degree approximating that required of it, the city faithfully performed all of its obligations and made payment for all the service rendered it, and even now after conditions have become intolerable, and it has become perfectly manifest that the water works company can not afford an adequate supply of wholesome water the city continues to receive and pay for water and will continue to pay for the same so long as it takes and uses the water. It has declared and again declares that the contract being executory is terminated because of repeated violations thereof on the part of the water works company and its demonstrated inability to comply in the future with the requirements of the contract.

Sixteenth. It is true that on the 14th day of September, 1902, the City Council of Columbus passed an ordinance providing for an election *on* by the qualified voters of the City of Columbus to be held December 4th, 1902, to determine whether the city should issue two hundred and fifty thousand dollars of bonds for the purpose of constructing, maintaining and operating a system of water works, but it is denied that the avowed purpose of furnishing water to private parties in competition with the Columbus Water Works Company was expressed in the ordinance. Respondents show that said ordinance was predicated upon express declaration therein contained that the Columbus Water Works Company had totally failed
157 to supply the city and its inhabitants with a sufficient quantity of pure and wholesome water. In this emergency it became necessary for the city to take proper steps looking to the preservation of the public health and to the furnishing of an adequate supply of water with pressure sufficient for the protection of property against fires. The ordinance contains no revocation of any right or franchise granted the Columbus Water Works Company, nor does it either avowedly, or in effect, in any wise impair the obligation of any contract.

It is true that the election as provided for in said ordinance was duly held and the proposition to issue bonds for the purpose of erecting new water works by the city was overwhelmingly carried, there being only seven adverse votes out of a total vote of 1647, thus manifesting the practically unanimous desire of the citizens of Columbus to escape from the evils inflicted upon them by the Columbus Water

Works Company, and from which they had so long suffered. Respondents admit that, pursuant to this vote, bonds for the purpose of erecting new water works have been duly issued and the same have been validated by the courts of the State of Georgia, in conformity with the statute in said case made and provided. Respondents further show that said bonds have been negotiated and sold, and that it is the purpose and intent of the city to devote the proceeds to the erection of a system of water works to be owned by the city.

158 It is denied that by its said action the city has in any way repudiated its contract with the Columbus Water Works Company in violation of the rights of complainant or any other person. It is again submitted that if the city should refuse to accept water from the water works company, or to pay therefor, and if such refusal should be in violation of the contract the injured party or parties would have a complete and adequate remedy at law. It is further submitted that the city has both a legal and equitable right to provide and is charged with the high duty of providing for an adequate and wholesome supply of water for domestic and sanitary purposes and for fire protection, and that to this end it has the right to refuse to be further bound by the terms of an executory contract when it has been demonstrated that the other party has utterly failed to comply with its obligations and is unable to comply therewith. The Columbus Water Works Company being insolvent and all of its property and assets being in the hands of a receiver of this court the water works company is unable to perform the contract even if it were otherwise able and willing so to do. Respondents further submit that the right of the city to issue bonds and provide for the erection of a system of water works depended upon conditions existing at the time the action was taken and prior thereto, and that nothing which may have subsequently occurred can affect the right of the city to stand upon the action then taken.

159 Seventeenth. In reply to the 18th paragraph of the bill respondents deny that there is any obligation on the part of the city of Columbus to purchase the said system of water works, and say that while the privilege of so doing was granted by the contract the city is under no obligation to avail itself thereof. It is denied that the building of the water works was supervised by a committee of council and citizens appointed by the mayor and council, and it is specifically denied as here in above shown that the requirements of the city were fully complied with in the building of said water works. It is denied that the rights and franchise granted the water works company by said contract were to continue until the water works should be purchased by the City of Columbus. It is admitted that the city has made no offer, nor has it taken any proceedings for the purchase of said plant in accordance with the privilege afforded in said contract, it having become manifest that the system as a whole is utterly inadequate to afford the service demanded by the City of Columbus and its inhabitants.

It is denied that improvements have been made on said system in accordance with the terms of the contract and in accordance with

the demands of the city and under the direction and supervision of the city authorities; on the contrary, it is averred that the water works company has utterly failed to extend and enlarge its system and make such improvements as were imperatively demanded by the increase in the growth of the city. The source of supply is utterly inadequate, unless the water from the Chattahoochee River is
160 resorted to. The conduit conveying the water from the reservoir to the city is only twelve inches in diameter as originally laid and has never been increased. The mains in the city are laid with pipes of four inch diameter and contain numerous dead ends so that it will be impossible to deliver an adequate amount of water through the pipes and mains of the present system even should the source of supply be amply sufficient for that purpose. To provide an adequate system for the City of Columbus, it will be necessary to abandon the present source of supply, to remove the present old and inadequate mains and pipes, and in effect to reconstruct and rebuild the entire system.

It is again denied that in providing for a new system of water works the city is disregarding the rights of complainant, or the holders of the bonds, or of the water works company, and it is denied that it is the intent and purpose of the *system* to render the system valu-less, or to force the same to be operated at a loss, or to deprive the water works company of its property without due process of law, or to disregard the contract rights of said company by pursuing a course subversive of the terms of the contract and of the good faith of the city. If there has been any lack of good faith it is to be imputed to the course of the water works company in failing and refusing to observe the requirements of the contract and to afford the service required of it.

161 Eighteenth. Respondents specifically deny that the purpose of the city is to destroy the value of the water works property by withdrawing from the city revenues necessary to its existence. It specifically denies that it has intended or desired to force the said company to sell its plant to the city at such price as the city may name; on the contrary, for reasons herein above stated, and for other good and sufficient reasons, the City of Columbus has no desire to purchase said water works system at any price, nor could it accept and use said system because of its many defects and insufficiencies. When the contract was entered into the water works company knew and was charged by law with the duty of knowing that if it failed or refused to comply with the obligations required of it under the contract and to at all times supply water of the quality and in the quantity and maintain the pressure demanded in the contract, the obligation of the other contracting party to take and pay for water and service would cease and be terminated.

Nineteenth. Respondents admit the filing of the bill by complainant against the Columbus Water Works Company and the appointment of William S. Greene as receiver, under order of this Honorable Court, and that leave has been granted by the court to the receiver to issue fifty thousand dollars of receiver's certificates. It is denied that the same is amply sufficient to supply said city with all the water

for all purposes that it can possibly need. The other allega-
162 tions contained in paragraph 20 of the bill are neither admitted nor denied for the want of sufficient information.

Twentieth. Respondents deny that there is now due and unpaid to the Columbus Water Works Company the sum of twenty five hundred dollars by the City of Columbus, or that the city is indebted to the water works company in any sum. Respondents show that had the water works company complied with the terms and conditions of the contract there would have been due the sum of $2,500.00 for the quarter ending the first day of July, 1902. Payment of the water rentals for this quarter was refused by the city because of the total failure of the water works company to perform the service required of it under the contract. The source of water supply failed almost entirely and the very small amount that was delivered through the pipes was foul of odor, putrid to the last degree unwholesome and utterly unfit for any domestic purposes. The citizens of the city were required to resort to the use of well water or purchase their drinking water from supplies brought in by private parties from neighboring springs. So great was the lask of water that the fire pressure was utterly inadequate and practically destroyed. The water company resorted to the use of river water, obtaining the water from a point in the river within the city limits and within a short distance from the point where the city sewerage was discharged. This was mixed with a small quantity of water obtained from the reservoir, but to no appreciable extent improved the quality of the water, for that it was muddy and continued
163 foul of odor and utterly unfit for domestic purposes. The conditions were intolerable and both the city and its citizens suffered from the evil consequences thereof. Respondents state on information and belief that the receiver has applied to the court for leave to refund the amounts paid by such water takers during this quarter as have made payment therefor, thereby fully recognising the worthlessness of the service.

Twenty-first. Respondents can neither admit nor deny, for want of sufficient information, that the Columbus Water Works Company has no property other than its plant and its contract with the City of Columbus, or the rentals stipulated to be paid by the city, and the revenues derived from private consumers, wherewith to meet its operating expenses and make payment of interest on its bonds. Respondents can not say whether under the administration of its affairs, the water works Company had expended in operating expenses the greater portion of its revenue derived from private consumers, or that without the water rentals from the city of Columbus it would be unable to pay the interest on its bonds. But respondents are impressed with the belief that the revenue derived from private consumers of the water should under an economical and careful management yield more than enough to pay operating expenses and necessary fixed charges based upon the value of the plant, provided the water works company can and will furnish a proper service. As to these matters, however, the respondents submit that they in no way concern the issues involved in the case. It is doubtless true that

if the water works company has no sufficient revenue to meet
164 its operating expenses and necessary fixed charges its water works plant would become of little value from a financial standpoint; and it is admitted that its mains machinery and material are of such age and character and so situated as to be of comparatively little value should the plant be dismantled and the materials removed.

Respondents submit that whether the City of Columbus could support two water works systems is a matter of conjecture, and that the statements contained in the bill bearing upon the question are argumentative and need not be further answered.

Twenty-second. Respondents are not informed as to who are the owners of the water works company's bonds and demand strict proof of ownership. They deny that it is impracticable for the holders of the bonds to take steps for their own protection, and they submit that the trustee has neither duty nor right to institute and maintain this suit without consultation with and appropriate request from the holders of the bonds, if indeed it would have any right at all. It is denied that the trustee can of its own volition maintain this suit.

Twenty-third. Respondents deny the assumption of fact contained in the opening clause of the 24th paragraph of the bill. They deny that the water works company has complied with the terms and conditions of its contract, and they deny that the City of Columbus or the General Assembly of the State of Georgia by the Act of December 3rd, 1902, or in any other way has attempted to impair
165 the obligation of said contract. They deny that the city has deprived the bondholders of the rental to be paid to it under said contract, and that said action and threatened action are in fraud and destruction of the rights of the bondholders, or any other person, or denies to them the protection guaranteed to them by the Constitution of the United States.

It is denied that the action of the city in adopting the ordinance ordering an election to determine whether water bonds should be issued for the purpose of erecting water works, or that the carrying of said election in favor of the proposition by more than the requisite two thirds of the qualified voters of said city, or that the action of the city declaring the result of said election or that any subsequent conduct on the part of said city of Columbus in giving effect to said ordinance, are attempts on the part of said city to impair the obligations of the contract in violation of the Constitution of the United States, or that they constitute an effort so to do, or that any action or conduct on the part of the city deprived or seeks to deprive the complainant or any other person of any right of property without due process of law, or constitute a denial as to them of the equal protection of the laws, or in any wise violate any right they or either of them may have.

It is submitted that a declaration on the part of the city that it will not be held further liable under an executory contract because of the utter failure and refusal of the other contracting party
166 to comply with the terms and conditions of the contract required of it in no wise impairs the obligation of any contract

but constitutes a simple denial of further liability thereunder, conceding the contract to be valid and binding if performed by the other party according to its terms and stipulations; and even should the city refuse to accept the service and make the payments stipulated and it should be determined that it had no right so to do, such action on its part would constitute merely a breach of the contract and not any impairment of its obligation.

Twenty-fourth. The allegations of fact contained in the 25th and 26th paragraphs of the bill are denied.

All of which matters and things these defendants are ready and willing to aver, maintain and prove as this Honorable Court shall direct; and having fully answered, these defendants pray that they may be hence dismissed with their reasonable costs and charges in this behalf most wrongfully sustained.

T. T. MILLER,
J. H. MARTIN,
ELLIS, WIMBISH & ELLIS,
Solicitors for Defendants.

T. T. MILLER,
Columbus, Ga.,
J. H. MARTIN,
Columbus, Ga.,
W. A. WIMBISH,
525 *Prudential Bldg., Atlanta, Ga.,*
Of Counsel.

167 STATE OF GEORGIA,
Muscogee County:

Personally appeared before the undersigned L. H. Chappell, who being duly sworn deposes and says that he is Mayor of the City of Columbus, one of the defendants named in the foregoing answer, and that the facts in said answer contained, so far as they relate to his acts and deeds as Mayor, are true of his own knowledge and so far as they relate to the acts and deeds of others he believes them to be true.

L. H. CHAPPELL.

Sworn to and subscribed before me, this October 5, 1903.

[SEAL.] A. W. COZART,
Notary Public, Muscogee Co., Ga.

Filed in office October 5, 1903.

O. C. FULLER, *Clerk,*
By N. A. BROWN, *Deputy.*

failed to take steps to provide for a water supply from some other source than the Columbus Water Works Company.

Whereupon, an ordinance was passed submitting to the voters of the city the question as to whether or not the city should issue bonds with the proceeds of which to build a system of water works to be owned and operated by the City of Columbus. Books for registration were opened and voters registered, an election was held on the 4th of December, 1902, when all of those registered voted except 87 and of these 1640 voted for bonds and only seven against bonds.

Afterwards, to-wit: on the 8th day of August, the mayor and
135 council having previously provided for the issue of two hundred and fifty thousand dollars of bonds, the same *was* sold, and with the proceed- it is the purpose of said city to build and own a system of water works for the city and its inhabitants.

And for special cause why a preliminary injunction or *ad interim* injunction should not be granted pending an adjudication of the controversy on its merits, these respondents show that the balance of convenience is decidedly in favor of the city. Should the injunction be granted and the city finally prevailed in its contentions and it should be adjudicated that it has the right to construct and operate its system of water works, the injury and damage which in the mean time would have resulted to the city and its inhabitants, would be irreparable for that the water works company is insolvent and the injury would be incapable of peecuniary estimation. If on the other hand the complainant should finally prevail its damages, if any could be easily ascertained by reference to the contract, and the city being entirely solvent would be able to respond to any judgment recovered against it; and in the meantime the water works company, or the receiver thereof, would continue to operate the property and receive the revenues therefrom. The bonds of the city have been voted, validated and sold; it would require a considerable length of time,

perhaps several years for the city to construct its own system
136 of water works; and if it should be eventually declared that the city could not rightfully maintain and operate such water works, an injunction at that time would be equally as effective as if granted sooner.

Wherefore, these respondents pray that the rule against them be dismissed, and that they may be hence discharged with their reasonable costs in this behalf incurred.

T. T. MILLER,
J. H. MARTIN,
ELLIS, WIMBISH & ELLIS,
Solicitors for Respondents Named.

T. T. MILLER,
J. H. MARTIN,
W. A. WIMBISH,
Of Counsel.

STATE OF GEORGIA, *County of Muscogee:*

In person appeared before the undersigned L. H. Chappell who being duly sworn deposes and says: that he is the Mayor of the City of Columbus, one of the respondents named in the foregoing re-

sponse, that he has read said response and knows the contents thereof, and that the facts therein stated are true, excepting that facts stated upon information and belief he verily believes to be true.

L. H. CHAPPELL.

Sworn to and subscribed before me this September 15th, 1903.

[SEAL.] A. W. COZART,
Notary Public, Muscogee Co., Ga.

137 *Appearances of Counsel for City of Columbus et al.*

Entered and Filed 5th Day of Sept., '03.

In the Circuit Court of the United States for the Northern District of Georgia, Western Division. In Equity.

September Rules, 1903.

MERCANTILE TRUST & DEPOSIT COMPANY OF BALTIMORE, Trustee, Complainants,
vs.
THE CITY OF COLUMBUS ET AL., Respondents.

To O. C. Fuller, Clerk U. S. Circuit Court:

You will please enter our appearance for respondents, other than the Columbus Water Works Co., in the above stated case.

At Columbus, Ga., this fifth day of September, 1903.

T. T. MILLER,
J. H. MARTIN,
ELLIS, WIMBISH & ELLIS,
Solicitors for Respondents.

T. T. MILLER,
Columbus, Ga.,
J. H. MARTIN,
Columbus, Ga.,
W. A. WIMBISH,
525 *Prudential Building, Atlanta, Ga.,*
Of Counsel.

138 No. 59. Entered and filed this 5th day of September, 1903.

O. C. FULLER, *Clerk,*
By N. A. BROWN, *Deputy.*

139 *Order Setting Hearing of Demurrer.*

In the Circuit Court of the United States for the Northern District of Georgia, Western Division.

No. 59. In Equity.

MERCANTILE TRUST & DEPOSIT COMPANY OF BALTIMORE
vs.
THE CITY OF COLUMBUS ET AL.

Bill.

Upon motion of counsel for defendants named in the above entitled cause (other than Columbus Water Works Company),

It is ordered, That the demurrer filed to the original bill by the said defendants be set down for hearing at the City of Atlanta, Georgia, on Monday, September 28th, 1903, at ten o'clock in the forenoon, or so soon thereafter as counsel can be heard.

Dated and signed at Atlanta, Georgia, this 18th day of September, 1903.

WM. T. NEWMAN,
U. S. Judge.

Service acknowledged and copy waived.

J. PACKARD.
HALL & WIMBERLY.
L. F. GARRARD.

September 19, 1903.

Filed in clerk's office 18 day of Sept., 1903.
O. C. FULLER, *Clerk.*

140 *Answer of City of Columbus and Mayor and Aldermen of said City.*

Filed October 5/03.

No. 59. In Equity.

In the Fifth Circuit Court of the United States for the Northern District of Georgia, Western Division.

MERCANTILE TRUST & DEPOSIT CO. OF BALTIMORE
vs.
CITY OF COLUMBUS ET AL.

Bill.

Answer of defendants, the City of Columbus and of the Mayor and Aldermen of said City.

These defendants respectively, without waiving their demurrer heretofore filed in this cause but wholly relying thereon; and now

and at all times saving to themselves any and all manner of benefit or advantage of exception or otherwise that can or may be had or taken to the many errors, uncertainties and imperfections in the said bill contained, for answer thereto or to so much thereof as these defendants are advised it is material or necessary for them to make answer to, severally answering, say:

First. It is admitted that the corporate character and citizenship of the separate parties are correctly set forth in the original bill; but it is denied that the individual defendants named as mayor and aldermen of the City of Columbus have any interest in the
141 controversy, or are proper parties to the cause, the corporate name of the city being "The City of Columbus," in which name it is authorized by law to sue and be sued.

Second. Respondents do not deny that the Columbus Water Works Company issued the bonds and secured the same by mortgage or deed of trust and created the plaintiff as trustee, as is alleged in the first paragraph of the bill; but they are without information further than from the allegations of the bill regarding due execution and issuance of said bonds and deed, or of the number of bonds that have been delivered, or of the number now in the possession of the receiver of this court, and these respondents demand strict proof of the allegation that 392 of said bonds are now outstanding and held by persons who purchased the same in open market for value.

Third. Respondents deny that said bonds were issued and sold by the Columbus Water Works Company in order to raise money wherewith to construct, equip and complete a system of water works for the purpose of carrying out its contract with the City of Columbus and on the contrary say that said bonds were not issue- until nine years after the water works system was constructed. Respondents are informed and believe that no bonds were originally issued for the purpose of constructing the system of water works, and not until 1888 did the water works company issue bonds, and that the bonds then issued amounted in the aggregate to $150,000.00 Re-
142 spondents state upon information and belief that the purpose for which said bonds were issued was not in order to construct, equip and complete a system of water works in accordance with the contract with the city, but that said bonds so issued in 1891 were used for the purpose of retiring the previous issue of 1888, and for the payment of dividends to stockholders of the Columbus Water Works Company, and for other purposes; that only the proceeds of a small number of said bonds have been used in extending, repairing or equipping the system of water works; that the entire cost of the water works system, including all moneys that have been spent thereon since its original construction, is very much less than $392,000.00, and that said system does not represent a cost or value of any such sum of money.

Fourth. It is true that under date of October 21st, 1882, the Columbus Water Works Company by its president submitted a communication to the mayor and council of the City of Columbus, stating that in accordance with the contract it had completed the system of water supply for the city, and that the water was then ready for dis-

tribution and use. On November 6th, 1882, this communication was considered by the Mayor and council and it was stated that the filters of the reservoir differed from those prescribed in the contract. Whereupon assurance was given by the water works company that the filter built was an improvement upon the one called for in the contract. Acting upon this assurance and upon the further
143 assurance of the water works company that the system had been completed in accordance with the terms and requirements of the contract, as will be further shown and explained hereinafter, the mayor and council of the city adopted a resolution accepting the same as appears from Exhibit C attached to the bill. Respondents deny that the system was completed in accordance with the requirements of the contract in the following particulars:

1. The water works company failed to provide a storage reservoir for water, having an available capacity for the storage and supply of not less than one hundred and twenty five million gallons of water when filled, as required by Article III of the contract, but instead thereof provided a reservoir having an available capacity or not more than forty million gallons of water. The capacity of said reservoir was not known to the mayor and council of the City of Columbus at the time said work was accepted, and was not known until in the year 1893, when, on account of the scarcity of water the mayor and council had a survey and measurements made of the reservoir, and thereby ascertained the capacity thereof.

2. The water works company failed to provide street mains of such sizes as would afford an ample supply of water to consumers and for fire protection, as provided in Article IX of the contract. At the time of the acceptance of the work, there was no way by which the mayor and council of the City of Columbus could ascer-
144 tain*ed* if the street mains were of sufficient sizes for the purpose intended, as there were no private consumers of water from the water works company and no fire had occurred to demonstrate the capacity of the mains, and reliance was therefore had upon the assurance of the water works company that the sizes of said street mains were ample to supply water as provided in the contract.

3. The water works company failed to provide a filter for water distribution as provided in Article XI of the contract, and while it admitted that the filter of the reservoir differed from the one prescribed in the contract, the Mayor and Council were assured that the one built was an improvement on the one described in the contract for the reason that it could be easily taken out and cleaned, when in truth and in fact the filter provided proved to be of no value whatever and was abandoned entirely in a short while after the water works was completed.

4. The water works company failed to construct the storage reservoir as provided in Article XII of the contract, in that stumps, roots, alluvial deposits, vegetable and unwholesome matter were not removed, but were allowed to remain in the reservoir, nor were thin edges to the water avoided by the making of excavations and embankments along the margin of the reservoir, as provided, but around

the greater portion of the reservoir there were no excavations
145 made and the water was allowed to stand at thin or feather edges, the consequence of which was that the water became unwholesome and impure in seasons of dry weather.

Fifth. The allegations contained in paragraph 6th of the bill are substantially true.

Sixth. Respondents admit that the Mayor and Council of the City of Columbus did agree and promise by Article XV of said contract that "in order to make provisions for the payment of water rents, the mayor and council, in making appropriations for the fire and sanitary departments, shall appropriate a sum sufficient to pay the annual rental of the water works, and the mayor and council shall receive in payment for any taxes due the City of Columbus the due coupons of any bond issued by Thomas R. White, to an amount not exceeding the rental due by the city to him, in any one year, and the coupons thus taken shall be received by him in cash payment for said rentals," but respondents deny that said article of said contract was entered into on account of the "great anxiety of the people of Columbus" and they further deny that the agreement on the part of the city to receive due coupons for any taxes due the City of Columbus constituted an element of credit in the sale of the bonds, or was very valuable thereto, or enabled the water works company to sell the bonds at a better price than it otherwise would have obtained. Respondents submit that the agreement was simply an arrangement under which instead of paying the rentals due
146 *pro tanto* directly to the water works company, the city consented to accept the due coupons in payment of obligations due to it by way of taxes, which was the equivalent of saying that payment should be made directly to the water works company or to the holders of the coupons of its bonds to the extent limited. In either case the credit of the city was pledged to the extent of the annual rentals due, and no further. Respondents can not admit, and therefore deny, that said bonds have passed into the hands of innocent holders for their full market value, and that said holders obtained said bonds relying to any greater degree upon the special provision for accepting due coupons in payment of taxes than upon faith that the city would perform the obligations of its contract generally. And respondents submit that said Article XV of said contract, in so far as it sought to bind succeeding mayors and councils of the City of Columbus to make annual provision for paying rentals to Thomas R. White, or his assignee, the Columbus Water Works Company, for future years, was and is null and void, because there was nothing in the charter of the city of Columbus at the time which authorized the mayor and council to make such a contract, nor were they authorized to do so by the qualified voters of said city.

Respondents aver that the holders of said bonds took the same with notice, first, of the want in authority of the mayor and council to bind subsequent mayors and councils by a contract of the character set fort- second: that even if said contract was valid, yet
147 it was executory and was only binding upon the City of Columbus upon the faithful performance on the part of the Columbus Water Works Company of the various obligations assumed

by it under said contract; and third, that under said contract nothing would be due the water works by the city until the service was rendered, and whether the service was rendered is a question of fact depending upon the ability and good faith of the water works company.

Seventh. Respondents admit that in the year 1886, the corporate limits of the City of Columbus were extended northward and eastward as alleged in the 8th paragraph of the bill; they also admit that the Columbus Water Works Company has erected a standpipe in said annexed territory, and has laid pipes extending from said standpipe, but they deny that said improvements were made in a manner satisfactory and acceptable to the Mayor and Council of the City of Columbus. On the contrary, the mayor and council of the City of Columbus endeavored to have said extensions made for at least ten years before they were made, during which time the people of said territory were entirely without fire protection, and when the extensions were finally made and completed in the year 1900, the supply of water furnished by the Columbus Water Works Company was insufficient to supply the entire system, and even if the supply in the reservoir had been sufficient, the main which conducts the
148 water from the reservoir to the city was too small to furnish the necessary water to the city, in consequence of which the work and service have proven very unsatisfactory and inefficient.

Eighth. Respondents admit to be true the allegations contained in the 9th paragraph of the bill, except that portion wherein it is alleged "that in many portions of the city on account of the poverty of the inhabitants, no permanent annual income on the extensions could be assured, yet the water works company has, from time to time, waived this stipulated amount of annual income, and extended its mains wherever the City of Columbus has desired fire hydrants." This allegation is denied.

Ninth. Respondents deny as alleged in the 10th paragraph of the bill that "said contract was entered into by the City of Columbus with the full knowledge and full assent of the inhabitants composing and constituting said municipal corporation." Respondents can neither admit nor deny, for want of sufficient information that "public sentiment in favor of said contract was unanimous." They admit that the authority to make said contract was not submitted to the qualified voters of the City of Columbus, but they deny that it was not necessary to do so, and they deny that the mayor and council of the City of Columbus were fully authorized to make said contract in all of its terms, and to bind the city of Columbus by all of its terms; and they deny that said contract is now a valid, legal and subsisting contract.

149 Tenth. Respondents deny "that the Columbus Water Works Company has used all of the income of said corporation over and above the sum required to meet the interest on its bonds in making improvements on said water works system."

They admit that the bridge at 14th Street was swept away as alleged, and that the pipes bringing the water to the city were swept away. They deny the allegations in reference to submerged mains.

They admit the other allegations contained in the 11th paragraph of the bill, except the allegation that ample water was supplied the city for fire protection by putting into operation a pumping system, which is denied.

Eleventh. Respondents deny that the Mayor and Council of the City of Columbus, in making said contract afforded to their constituency ample opportunity to object to carrying out said contract. They admit that they did not act hastily but investigated the plans of different systems and that the contract was published as alleged, but they deny that "every citizen taxpayer and inhabitant accepted the contract as the authorized act of the City of Columbus." They admit the incorporation of the water works company, as alleged; also of the construction of the system of water works; but they deny that it was constructed in accordance with the specifications and requirements of the contract. They deny that, after being tested, it was found to be fully up to the contract requirements and satisfactory in every particular. They deny that "from the date of said acceptance the said company has continued to maintain and operate
150 said system of water works in full compliance with said contract, and has furnished to the City of Columbus free and unrestricted use of its water for protection against fire, in accordance with its contract, and in every respect has fulfilled and met, observed, kept and performed all of the obligations resting upon it under and by virtue of said contract."

Respondents admit that the City of Columbus has from November, 1882, used the water of said company for fire protection and for preventing the spread of conflagrations, but the respondents say that the service rendered the city by said water works company has for a large portion of said time fallen far short of that promised under said contract, as will hereinafter be more fully set forth.

Respondents admit that the inhabitants of the City of Columbus did not protest or object to the building of the water works system by the said water works company, nor have they objected to an extension of the same; on the contrary, they, as well as the mayor and council of the City of Columbus, would have been perfectly satisfied had the water works company carried out the contract in accordance with the terms thereof, and had the said Columbus Water Works Company been *has* faithful and diligent in carrying out said contract according to the terms thereof by furnishing the city and inhabitants of the city with an ample supply of good and wholesome water, as the city and inhabitants have been patient, forbearing and
151 suffering, no trouble or differences would have arisen between the mayor and council of the city and said water works company.

Twelfth. Respondents deny, as alleged in paragraph 13th of the bill "that it was known and contemplated by said City of Columbus at the time of entering into said contract, that the money required to build said system of water works was to be raised in whole or in part by the issue and sale of the bonds of the Columbus Water Works Company, and that the rentals which the City of Columbus was to pay would constitute the source from which the bondholders were to

be paid the interest on their bonds and from which a fund would be provided toward the ultimate payment of the same." And respondents say that the said system of water works as originally constructed was not built from the proceeds arising from the sale of bonds, nor was it necessary to issue bonds for the construction of same, nor were bonds issued for that purpose.

And respondents deny that "bonds were issued and sold *bona fide* to an unsuspecting public" and deny that "by the provision of said contract whereby the city agreed to receive in payment of any taxes due the City of Columbus the due coupons of any bond issued by Thomas R. White, to an amount not exceeding the rental due by the City to him in any one year; and the coupons thus taken shall be received by him as cash in payment of said rentals," that the city thereby invited persons to become purchasers of said bonds.

Thirteenth. Respondents deny that the bonds of the said
152 Columbus Water Works Company, issued as contemplated by said contract were issued and sold upon the faith that the City of Columbus would pay said rental annually, as by said contract it had promised to do. And respondents deny that "the proceeds of said bonds amounting to three hundred and ninety-two thousand dollars were used in the construction of said system of water works." Respondents aver, upon information and belief, that the water works system as first constructed was built with the money subscribed by the stockholders of the Columbus Water Works Company, and without the issue and sale of any bonds whatever. That afterwards, to wit: in 1888, the Columbus Water Works Company issued bonds to the amount of one hundred and fifty thousand dollars for the purpose of reimbursing its then stockholders for the money subscribed and paid in to the capital stock of said Columbus Water Works Company, and that thereafter, in the year 1890, H. H. Epping, T. M. Foley, and others, purchased the stock of said company, and shortly thereafter, to-wit: in 1891, issued three hundred and twenty five thousand dollars of bonds, and with the proceeds thereof retired the one hundred and fifty thousand dollars of said bonds which had been issued in 1888, and the balance, or so much thereof as was necessary was used to reimburse the then stockholders for the amount they had paid for the stock. And that the purchasers of said bonds knew, or could by the exercise of proper diligence have known, that said bonds were not issued and sold for the construction or extension of said water works, and that the said system was not worth
153 the amount of said bonds.

At the time of the issuance of said bonds, and for sometime prior thereto, the service performed by the water works company was very inefficient and exceedingly unsatisfactory to the City of Columbus, of which the water works company had been repeatedly notified. As early as September, 1886, the mayor and council formally declared the water to be insufficient in supply and very unwholesome in quality and called upon the water works company to correct the evils complained of, which the said company promised that it would endeavor to do. From that time numerous and frequent complaints were made. In April, 1887, a committee from the City Council accompanied by the then superintendent of the water

work- company, tested the pressure and found the same deficient and not in accordance with the requirements of the contract. The committee further found that the water works company had not faithfully complied with its contract, and upon this report the city declined to pay the water rentals which had accrued. Following this complaint, the water company again promised to take immediate steps to remedy the defects pointed out, which, as usual, it utterly failed to do. The least diligence or investigation on the part of persons contemplating purchase of the bonds of the water works company would have disclosed the fact that the system was inadequate the service inefficient, the quality of the water unwholesome and the situation, as a whole, so unsatisfactory to the City of Colum-
154 bus that the contract was at any time liable to be declared null and void and cancelled because of the failure on the part of the water works company to comply with the obligations thereof.

Fourteenth. Respondents deny that said contract was entered into by the city authorities by and with the consent of the citizens of said city, excepting that, as hereinbefore stated, both the city and its citizens desired an adequate and satisfactory system of water works, and would have been, and would be now, perfectly satisfied had the water works company faithfully performed the obligations assumed by it under the contract. Respondents submit that no question of estoppel by reason of acquiescense is involved in this case, inasmuch as the water works company chose to deal with the city authorities by express contract, and did not rely and could not have relied upon any acquiescence on the part of the citizens. The city has at all times faithfully performed its part of the contract; has paid liberally for all the water used and for the service rendered, although such water was frequently deficient in quantity and the service very unsatisfactory. The contract being executory in its nature and the city, after long and patient indulgence, having become fully convinced that the water works company can not and will not perform the service required of it under said contract, declines on its part to be bound to the performance of the obligations assumed by it.

Fifteenth. Respondents admit as true the allegations contained in the 16th paragraph of the bill as to the provisions of said con-
155 tract in reference to the exclusive privilege granted to the Columbus Water Works Company, and as to the privilege of the City of Columbus to purchase said water works, but respondents say that the mayor and council of the City of Columbus had no authority to grant to the Columbus Water Works Company the exclusive privilege of maintaining and operating water works in said city, that the power to grant the same is forbidden by the Constitution and laws of the State of Georgia. And respondents further say that the mayor and council of the City of Columbus had no authority to bind the City of Columbus conditionally or otherwise to purchase said system of water works after fifteen years, as provided in said contract, and said provision in said contract was and is invalid and of no force and effect whatever.

And respondents deny that under said contract, the mayor and council can not build or operate any water works system of its own,

for its own use or for the use of others during the period mentioned in said contract, and they deny that said contract is still in force and is a binding and valid contract; but they say that even if said contract was a valid contract when entered into by the respective parties, it has ceased to be binding upon the City of Columbus, for the reason that the said Columbus Water Works Company has repeatedly violated the terms and conditions of the same.

Respondents show that the City of Columbus has not revoked or attempted to revoke the franchise granted the water works company to construct, maintain and operate its system of water works,
156 and for this purpose to use the streets of the city, nor has the city in any way or to any extent violated or sought to violate, the obligations of its contract. So long as the water works company rendered a service in any degree approximating that required of it, the city faithfully performed all of its obligations and made payment for all the service rendered it, and even now after conditions have become intolerable, and it has become perfectly manifest that the water works company can not afford an adequate supply of wholesome water the city continues to receive and pay for water and will continue to pay for the same so long as it takes and uses the water. It has declared and again declares that the contract being executory is terminated because of repeated violations thereof on the part of the water works company and its demonstrated inability to comply in the future with the requirements of the contract.

Sixteenth. It is true that on the 14th day of September, 1902, the City Council of Columbus passed an ordinance providing for an election *on* by the qualified voters of the City of Columbus to be held December 4th, 1902, to determine whether the city should issue two hundred and fifty thousand dollars of bonds for the purpose of constructing, maintaining and operating a system of water works, but it is denied that the avowed purpose of furnishing water to private parties in competition with the Columbus Water Works Company was expressed in the ordinance. Respondents show that said ordinance was predicated upon express declaration therein contained that the Columbus Water Works Company had totally failed
157 to supply the city and its inhabitants with a sufficient quantity of pure and wholesome water. In this emergency it became necessary for the city to take proper steps looking to the preservation of the public health and to the furnishing of an adequate supply of water with pressure sufficient for the protection of property against fires. The ordinance contains no revocation of any right or franchise granted the Columbus Water Works Company, nor does it either avowedly, or in effect, in any wise impair the obligation of any contract.

It is true that the election as provided for in said ordinance was duly held and the proposition to issue bonds for the purpose of erecting new water works by the city was overwhelmingly carried, there being only seven adverse votes out of a total vote of 1647, thus manifesting the practically unanimous desire of the citizens of Columbus to escape from the evils inflicted upon them by the Columbus Water

Works Company, and from which they had so long suffered. Respondents admit that, pursuant to this vote, bonds for the purpose of erecting new water works have been duly issued and the same have been validated by the courts of the State of Georgia, in conformity with the statute in said case made and provided. Respondents further show that said bonds have been negotiated and sold, and that it is the purpose and intent of the city to devote the proceeds to the erection of a system of water works to be owned by the city.

158 It is denied that by its said action the city has in any way repudiated its contract with the Columbus Water Works Company in violation of the rights of complainant or any other person. It is again submitted that if the city should refuse to accept water from the water works company, or to pay therefor, and if such refusal should be in violation of the contract the injured party or parties would have a complete and adequate remedy at law. It is further submitted that the city has both a legal and equitable right to provide and is charged with the high duty of providing for an adequate and wholesome supply of water for domestic and sanitary purposes and for fire protection, and that to this end it has the right to refuse to be further bound by the terms of an executory contract when it has been demonstrated that the other party has utterly failed to comply with its obligations and is unable to comply therewith. The Columbus Water Works Company being insolvent and all of its property and assets being in the hands of a receiver of this court the water works company is unable to perform the contract even if it were otherwise able and willing so to do. Respondents further submit that the right of the city to issue bonds and provide for the erection of a system of water works depended upon conditions existing at the time the action was taken and prior thereto, and that nothing which may have subsequently occurred can affect the right of the city to stand upon the action then taken.

159 Seventeenth. In reply to the 18th paragraph of the bill respondents deny that there is any obligation on the part of the city of Columbus to purchase the said system of water works, and say that while the privilege of so doing was granted by the contract the city is under no obligation to avail itself thereof. It is denied that the building of the water works was supervised by a committee of council and citizens appointed by the mayor and council, and it is specifically denied as here in above shown that the requirements of the city were fully complied with in the building of said water works. It is denied that the rights and franchise granted the water works company by said contract were to continue until the water works should be purchased by the City of Columbus. It is admitted that the city has made no offer, nor has it taken any proceedings for the purchase of said plant in accordance with the privilege afforded in said contract, it having become manifest that the system as a whole is utterly inadequate to afford the service demanded by the City of Columbus and its inhabitants.

It is denied that improvements have been made on said system in accordance with the terms of the contract and in accordance with

the demands of the city and under the direction and supervision of the city authorities; on the contrary, it is averred that the water works company has utterly failed to extend and enlarge its system and make such improvements as were imperatively demanded by the increase in the growth of the city. The source of supply is utterly inadequate, unless the water from the Chattahoochee River is
160 resorted to. The conduit conveying the water from the reservoir to the city is only twelve inches in diameter as originally laid and has never been increased. The mains in the city are laid with pipes of four inch diameter and contain numerous dead ends so that it will be impossible to deliver an adequate amount of water through the pipes and mains of the present system even should the source of supply be amply sufficient for that purpose. To provide an adequate system for the City of Columbus, it will be necessary to abandon the present source of supply, to remove the present old and inadequate mains and pipes, and in effect to reconstruct and rebuild the entire system.

It is again denied that in providing for a new system of water works the city is disregarding the rights of complainant, or the holders of the bonds, or of the water works company, and it is denied that it is the intent and purpose of the *system* to render the system valu-less, or to force the same to be operated at a loss, or to deprive the water works company of its property without due process of law, or to disregard the contract rights of said company by pursuing a course subversive of the terms of the contract and of the good faith of the city. If there has been any lack of good faith it is to be imputed to the course of the water works company in failing and refusing to observe the requirements of the contract and to afford the service required of it.

161 Eighteenth. Respondents specifically deny that the purpose of the city is to destroy the value of the water works property by withdrawing from the city revenues necessary to its existence. It specifically denies that it has intended or desired to force the said company to sell its plant to the city at such price as the city may name; on the contrary, for reasons herein above stated, and for other good and sufficient reasons, the City of Columbus has no desire to purchase said water works system at any price, nor could it accept and use said system because of its many defects and insufficiencies. When the contract was entered into the water works company knew and was charged by law with the duty of knowing that if it failed or refused to comply with the obligations required of it under the contract and to at all times supply water of the quality and in the quantity and maintain the pressure demanded in the contract, the obligation of the other contracting party to take and pay for water and service would cease and be terminated.

Nineteenth. Respondents admit the filing of the bill by complainant against the Columbus Water Works Company and the appointment of William S. Greene as receiver, under order of this Honorable Court, and that leave has been granted by the court to the receiver to issue fifty thousand dollars of receiver's certificates. It is denied that the same is amply sufficient to supply said city with all the water

for all purposes that it can possibly need. The other allega-
162 tions contained in paragraph 20 of the bill are neither admitted nor denied for the want of sufficient information.

Twentieth. Respondents deny that there is now due and unpaid to the Columbus Water Works Company the sum of twenty five hundred dollars by the City of Columbus, or that the city is indebted to the water works company in any sum. Respondents show that had the water works company complied with the terms and conditions of the contract there would have been due the sum of $2,500.00 for the quarter ending the first day of July, 1902. Payment of the water rentals for this quarter was refused by the city because of the total failure of the water works company to perform the service required of it under the contract. The source of water supply failed almost entirely and the very small amount that was delivered through the pipes was foul of odor, putrid to the last degree unwholesome and utterly unfit for any domestic purposes. The citizens of the city were required to resort to the use of well water or purchase their drinking water from supplies brought in by private parties from neighboring springs. So great was the lask of water that the fire pressure was utterly inadequate and practically destroyed. The water company resorted to the use of river water, obtaining the water from a point in the river within the city limits and within a short distance from the point where the city sewerage was discharged. This was mixed with a small quantity of water obtained from the reservoir, but to no appreciable extent improved the quality of the water, for that it was muddy and continued
163 foul of odor and utterly unfit for domestic purposes. The conditions were intolerable and both the city and its citizens suffered from the evil consequences thereof. Respondents state on information and belief that the receiver has applied to the court for leave to refund the amounts paid by such water takers during this quarter as have made payment therefor, thereby fully recognising the worthlessness of the service.

Twenty-first. Respondents can neither admit nor deny, for want of sufficient information, that the Columbus Water Works Company has no property other than its plant and its contract with the City of Columbus, or the rentals stipulated to be paid by the city, and the revenues derived from private consumers, wherewith to meet its operating expenses and make payment of interest on its bonds. Respondents can not say whether under the administration of its affairs, the water works Company had expended in operating expenses the greater portion of its revenue derived from private consumers, or that without the water rentals from the city of Columbus it would be unable to pay the interest on its bonds. But respondents are impressed with the belief that the revenue derived from private consumers of the water should under an economical and careful management yield more than enough to pay operating expenses and necessary fixed charges based upon the value of the plant, provided the water works company can and will furnish a proper service. As to these matters, however, the respondents submit that they in no way concern the issues involved in the case. It is doubtless true that

if the water works company has no sufficient revenue to meet
164 its operating expenses and necessary fixed charges its water works plant would become of little value from a financial standpoint; and it is admitted that its mains machinery and material are of such age and character and so situated as to be of comparatively little value should the plant be dismantled and the materials removed.

Respondents submit that whether the City of Columbus could support two water works systems is a matter of conjecture, and that the statements contained in the bill bearing upon the question are argumentative and need not be further answered.

Twenty-second. Respondents are not informed as to who are the owners of the water works company's bonds and demand strict proof of ownership. They deny that it is impracticable for the holders of the bonds to take steps for their own protection, and they submit that the trustee has neither duty nor right to institute and maintain this suit without consultation with and appropriate request from the holders of the bonds, if indeed it would have any right at all. It is denied that the trustee can of its own volition maintain this suit.

Twenty-third. Respondents deny the assumption of fact contained in the opening clause of the 24th paragraph of the bill. They deny that the water works company has complied with the terms and conditions of its contract, and they deny that the City of Columbus or the General Assembly of the State of Georgia by the Act of December 3rd, 1902, or in any other way has attempted to impair
165 the obligation of said contract. They deny that the city has deprived the bondholders of the rental to be paid to it under said contract, and that said action and threatened action are in fraud and destruction of the rights of the bondholders, or any other person, or denies to them the protection guaranteed to them by the Constitution of the United States.

It is denied that the action of the city in adopting the ordinance ordering an election to determine whether water bonds should be issued for the purpose of erecting water works, or that the carrying of said election in favor of the proposition by more than the requisite two thirds of the qualified voters of said city, or that the action of the city declaring the result of said election or that any subsequent conduct on the part of said city of Columbus in giving effect to said ordinance, are attempts on the part of said city to impair the obligations of the contract in violation of the Constitution of the United States, or that they constitute an effort so to do, or that any action or conduct on the part of the city deprived or seeks to deprive the complainant or any other person of any right of property without due process of law, or constitute a denial as to them of the equal protection of the laws, or in any wise violate any right they or either of them may have.

It is submitted that a declaration on the part of the city that it will not be held further liable under an executory contract because of the utter failure and refusal of the other contracting party
166 to comply with the terms and conditions of the contract required of it in no wise impairs the obligation of any contract

but constitutes a simple denial of further liability thereunder, conceding the contract to be valid and binding if performed by the other party according to its terms and stipulations; and even should the city refuse to accept the service and make the payments stipulated and it should be determined that it had no right so to do, such action on its part would constitute merely a breach of the contract and not any impairment of its obligation.

Twenty-fourth. The allegations of fact contained in the 25th and 26th paragraphs of the bill are denied.

All of which matters and things these defendants are ready and willing to aver, maintain and prove as this Honorable Court shall direct; and having fully answered, these defendants pray that they may be hence dismissed with their reasonable costs and charges in this behalf most wrongfully sustained.

T. T. MILLER,
J. H. MARTIN,
ELLIS, WIMBISH & ELLIS,
Solicitors for Defendants.

T. T. MILLER,
Columbus, Ga.,
J. H. MARTIN,
Columbus, Ga.,
W. A. WIMBISH,
525 *Prudential Bldg., Atlanta, Ga.,*
Of Counsel.

167 STATE OF GEORGIA,
Muscogee County:

Personally appeared before the undersigned L. H. Chappell, who being duly sworn deposes and says that he is Mayor of the City of Columbus, one of the defendants named in the foregoing answer, and that the facts in said answer contained, so far as they relate to his acts and deeds as Mayor, are true of his own knowledge and so far as they relate to the acts and deeds of others he believes them to be true.

L. H. CHAPPELL.

Sworn to and subscribed before me, this October 5, 1903.
[SEAL.] A. W. COZART,
Notary Public, Muscogee Co., Ga.

Filed in office October 5, 1903.
O. C. FULLER, *Clerk,*
By N. A. BROWN, *Deputy.*

Paragraph II.

Defendant admits the second and third paragraphs of said
199 cross-bill.

Paragraph III.

For answer to the fourth paragraph of said cross bill, it refers to the original contract, which is attached to the original bill of complaint in this case. It denies that the substance or effect of said contract is correctly set forth in said cross-bill. It denies that it has failed or refused to keep and perform the covenants of the contract.

Paragraph IV.

In answer to the fifth paragraph of the cross-bill, it says that the city accepted the water works constructed by this defendant, after the fullest and most careful examination was had by the skilful and thoroughly competent persons employed by the city for that purpose. It denies that such acceptance was based upon any promises or assurances that this defendant failed to keep and perform.

Paragraph V.

It denies the allegations contained in the sixth, seventh, eighth, ninth, and tenth paragraphs of the cross bill.

Paragraph VI.

In answer to the 11th paragraph of said cross bill, it denies that it has failed to extend and improve its system, so as to keep pace with the growth of the city and increased demands for water, as required by the contract; on the contrary, it says that it has made extensive additions, improvements and betterments, at large expense,
200 and the system as a whole is better than at the time the same was first accepted by the city; this defendant says that extensions of the system to the new territory annexed to the City of Columbus in 1886 would have been made earlier, but for the conduct and default of the city in failing to make any fair or adequate arrangement with this defendant therefor, and but for the failure of the city to carry out the provisions of the contract with reference to such extensions. The extensions actually begun in 1898 and completed in 1900 were accepted by the city as satisfactory, and the system as a whole, after the changes and extensions completed in said last mentioned year, was accepted by the city as satisfactory.

Prior to 1898 this defendant had extended some pipes and established several fire hydrants in the annex north of the street known as 17th in said city, without the guarantee of revenue that defendant was entitled to under the contract.

It is not true that defendant failed to furnish requisite pressure or otherwise to comply with its contract.

Paragraph VII.

In answer to the 12th paragraph of the cross bill defendant says that it has at all times complied substantially with its contract, and

as to the instances mentioned in the 12th paragraph of the cross-bill of alleged failure, defendant says that in the summer of 1902 referred to in said paragraph there was an unforeseen emergency, arising out of an unprecedented drouth, and this defendant
201 was proceeding as expeditiously as possible to remedy the condition brought about thereby, until the city by its conduct placed it out of the power of defendant to carry out the arrangements which it had already on foot; and which would have been carried out, but for such conduct.

And further answering said 12th paragraph of the cross bill, defendant says that beginning in 1894, the City of Columbus has placed obstacles in the way of its making additions, improvements, extensions and betterments by its persistent course of threatened repudiation and refusal to be bound by the terms of the contract, and by making requirements not only in disregard of the contract, but utterly unreasonable.

The city has at no time taken action calling for a change of the source of supply or calling for a test as to the purity or wholesomeness of the water furnished, as provided by the contract. This defendant has expended large sums of money enlarging and improving its water works system notwithstanding the city's unjust and unreasonable attitude and course of conduct.

Paragraph VIII.

In answer to the 13th paragraph of the cross-bill, this defendant says that it denies that the conduct of the city in said paragraph was justifiable or proper; defendant says that it has at all times endeavored to comply with the provisions of the contract and that such conditions as call for remedy were brought about by the un-
202 friendly and unjust attitude and course of conduct adopted by the City of Columbus.

Paragraph IX.

Defendant further answering denies each and every allegation set forth and contained in each and every paragraph of said cross bill not hereinbefore specifically answered.

And defendant having fully answered prays to be hence discharged.

COLUMBUS WATER WORKS COMPANY,
By H. H. EPPING, *President.*

Filed in Clerk's office, Dec. 7, 1903.

O. C. FULLER, *Clerk.*
By N. A. BROWN, *Deputy.*

203 *Replication of Mercantile Trust & Deposit Co. to Answer of the City of Columbus.*

Filed Dec. 8, 1903.

In the Fifth Circuit Court of the United States for the Northern District of Georgia, Western Division. In Equity.

THE MERCANTILE TRUST & DEPOSIT COMPANY OF BALTIMORE, Trustee,

v.

THE CITY OF COLUMBUS, LUCIUS H. CHAPPELL, E. P. DISMUKES, J. I. DARBY, W. C. LAWRENCE, J. D. McPHAIL, N. L. DUDLEY, L. T. JONES, R. WEILAND, J. T. MONCRIEF, J. L. NEWMAN, W. J. HARTMAN, L. A. CAMP, F. M. SOMMERKAMP, E. J. WYNN, J. H. McKNIGHT, MAX BANNER, T. E. MITCHELL, and COLUMBUS WATER WORKS COMPANY.

The replication of the Mercantile Trust & Deposit Company, Complainant, to the answer of the City of Columbus, one of the defendants in the above stated cause.

This repliant, saving and reserving to itself all and all manner of advantage of exception, which may be had and taken to the manifold errors, uncertainties, and insufficiencies of the answer of the said defendant, for replication thereunto, saith, that it doth and will ever aver, maintain and prove *his* said bill to be true, certain, and sufficient in the law to be answered unto by the said defendant, and that the answer of the said defendant is very uncertain, evasive and insufficient in law, to be replied unto by this repliant; without that, that any other matter or thing in the said answer contained,
204 material or effectual in the law to be replied unto, and not herein and hereby well and sufficiently replied unto, confessed or avoided, traversed or denied, is true; all which matters and things this repliant is ready to aver, maintain, and prove as this honorable court shall direct, and humbly prays as in and by its said bill it hath already prayed.

J. PACKARD,
HALL & WIMBERLY,
L. F. GARRARD,
Solicitors for Complainant.

Filed in office 8th day of December, 1903.

O. C. FULLER, *Clerk*,
By N. A. BROWN, *Deputy*.

205 *Order Overruling Demurrer of City of Columbus to Bill of Complaint.*

Filed 8 Dec., 1903.

In the Fifth Circuit Court of the United States for the Northern District of Georgia, Western Division. In Equity.

THE MERCANTILE TRUST & DEPOSIT COMPANY OF BALTIMORE, Trustee,
vs.
THE CITY OF COLUMBUS ET AL.

Bill, etc.

Order Overruling Demurrer of Defendant City of Columbus.

The defendant, City of Columbus, having filed its demurrer to the bill of complaint in the above stated cause and also its demurrer to the amendment to said bill, and said demurrers having come on to be heard, and after hearing argument of counsel thereon, it is ordered by the court that said demurrers be and the same are hereby overruled, on each and every ground set forth therein.

This the 8th day of Dec., 1903.

WM. T. NEWMAN,
United States Judge.

Filed in Clerk's office 8th December, 1903.
O. C. FULLER, *Clerk.*
By N. A. BROWN, *Deputy.*

206 *Opinion of Judge Wm. T. Newman on Injunction Pendente Lite.*

Filed Nov. 20, '03.

In the Circuit Court of the United States for the Northern District of Georgia, Western Division.

No. 59. In Equity.

THE MERCHANTILE TRUST & DEPOSIT CO. OF BALTIMORE
vs.
THE CITY OF COLUMBUS ET AL.

The present hearing of this case is on an application for injunction *pendente lite*. The matter has been fully and ably argued by counsel for the respective parties, and submitted.

The case should first be considered upon the legal questions involved. The most important of these questions is as to whether the

contract between the City and the Water Works Company created an indebtedness in violation of the Constitution of the State of Georgia; and in determining this, whether this court will follow the decisions of the Supreme Court of the State, or those of the Supreme Court of the United States. A recent case decided in this court, Trust Co. *vs.* City of Dawson *et al.*, is controlling, and should be followed so far as applicable. Certainly a contrary ruling will not be made until the final determination of that case by the Supreme Court of the United States where it is now pending on appeal.

207 In the Dawson case the report of the master stated this question in this way: "It is insisted that the decision of the Supreme Court of Georgia, declaring the invalidity of the contract, will be regarded as conclusive in this forum in deference to the rule that the Federal Courts will follow the construction given constitutions and statutes by the highest Court of the State. The general rule is as stated, but it is subject to important limitation and exceptions. The Federal Court, in construing the meaning of a State statute as to what contract is contained therein and whether the State has passed any law impairing its obligations, is not bound by previous decisions in State Courts, except when they have been so long and so firmly established as to constitute a rule or property; but will decide independently whether there is a contract and whether its obligation has been impaired."

After citing a number of authorities and discussing them at some length, the special master taking up the question *up* of the state of the law in the courts of the United States, says: "That such a contract does not create a "debt" is not an open question in this forum. Upon this point the case of Walla Walla *v.* Walla Walla Water Company, 172 U. S. 1, 43 L. Ed. 341; is conclusive. In that case the City obligated itself to pay the water company $1,500 annually in quarterly installments, for twenty-five years, for the use of water for fire purposes. The charter of the City limited the amount 208 of indebtedness it could incur. The sum of the installments agreed to be paid for the period named, would, if treated as a debt, cause the indebtedness of the City to exceed the Charter limitations.

"This court, after declaring that the weight of authority, as well as of reason, favors the construction that a municipal corporation may contract for a supply of water or gas or like necessity, and may stipulate for the payment of an annual rental for the gas or water furnished each year, notwithstanding the aggregate of its rentals during the life of the contract may exceed the City's authorized indebtedness says: "There is a distinction between a debt and a contract for a future indebtedness to be incurred, provided the contracting party perform the agreement out of which the debt may arise. There is also a distinction between the latter case and one where an absolute debt is created at one, as, by the issue of railway bonds or for the erection of a public improvement—though such debt be payable in the future by installments. In the one case the indebtedness is not created until the consideration has been fur-

nished; in the other the debt is created at once, the time of payment being only postponed.

"In the case under consideration the annual rental did not become an indebtedness within the meaning of the charter until the water appropriate to that year had been furnished. If the company
209 had failed to furnish it, the rental would not have been payable at all, and while the original contract provided for the creation of an indebtedness, it was only upon condition that the company performed its own obligation." After some further discussion of the matter the special master says: "I conclude on this branch of the case that the contract question did not create a debt within the meaning of the Georgia constitution."

The master discusses the effect and state of the decisions of the Supreme Court of the State at the time the Dawson contract was entered into, and cites among other cases that of Mayor of Rome *v.* McWilliams, 67 Ga., 106, decided at the September Term 1881, and also the case of Butts *v.* Little, 68 Ga., 272, also decided in 1881. He also cites some cases subsequent to the two cases named decided prior to the making of the Dawson contract in 1890, which were pertinent probably to the Dawson case, but which are not pertinent here. The report of the special master then proceeds: "The principle in these cases" (from 1881 to -890) "was consistent with that declared in Rome *v.* McWilliams, 67 Ga., 106, and Butts *v.* Little, 68 Ga., 272, that the obligation to pay for work when and as it shall be performed in future, by an annual levy of taxes sufficient to meet the accruing installments, does not create an indebtedness within the meaning of the Georgia Constitution. These cases certainly warrant the conclusion that at the time the contract was entered into
210 with the Water Company contracts of that character had not been declared invalid by the Supreme Court of Georgia. Indeed that court has deemed it necessary to overrule Butts *v.* Little (Lewis *v.* Lofley, 92 Ga. 804, Dawson *v.* Water Works Co., 106 Ga. 727) and to over rule, qualify or distinguish several of the other cases referred to in this report.

"It cannot therefore fairly be said that there was such a settled course of judicial decisions in Georgia on this question, at the time of the making of the contract, as to constrain the courts of the United States to follow later decisions of the State Court, especially in a case where the rights of innocent third persons are concerned."

"Subsequent to the making of this contract and after the rights of the complainant and the bond holders had been acquired, the Supreme Court of Georgia unequivocally held that contracts of this character constituted the creation of an indebtedness within the inhibition of the State Constitution.

> Cartersville Imp. Co. *v.* Cartersville, 89 Ga. 683; Cartersville Water Co. *v.* Cartersville, 89 Ga. 689; City of Dawson *v.* Dawson Water Works Co. 106 Ga. 696."

"I therefore conclude that this Court is not bound to follow the later decisions of the State Court as to the validity of the contract in question, but should exercise its independent judgment with refer-

ence thereto." From these citations it will be seen that the
211 decisions of the Supreme Court of the State were quite as favorable to the validity of the contract in this case as they were at the time of the contract in the Dawson case. If in that respect, there is any distinction in the two cases, it is favorable to the complainants here. Another question involved here on the law of the case, is as to the power of the City to make this contract, and also as to its effect against the city when made. On this question, in the report of the master in the Dawson case, the following is said.

"It is contended on the part of the City that no exclusive franchise to occupy the streets and maintain a water works system could be lawfully granted; and from this it is argued that the franchise may be revoked and the City may use its streets for its own system. "The grant of a right to supply water to a city, and its inhabitants, through pipes and mains laid in the streets upon the condition of the performance of its service by the grantee, is a grant of a franchise in consideration of the performance of a public service and after performance by the grantee is a contract protected by the Constitution of the United States. Walla Walla *v.* Walla Walla Water Co., 172 U. S. 1, 43 L. Ed. 341, and cases there cited. The right of a city to do those things necessary to supply its inhabitants with water for domestic use, or to provide the city with protection against fire, is the settled law of Georgia. Dawson *v.* Dawson Water Works,
106 Ga. 709; Frederick *v.* Augusta, 5 Ga. 561; Rome *v.*
212 Cabott, 28 Ga. 50; Wells *v.* Atlanta, 43 Ga. 67. An incident to the principal undertaking the city possesses the power to grant the use of its streets, and to contract with a private company for an exclusive supply of water for fire protection.

"It is unnecessary to decide whether the city may grant an exclusive franchise for a long number of years in excess of the contractual period between the City and the Water Company. Should a third person in good faith seek a franchise for the use of the streets for a similar purpose, the point would be properly involved. The question now presented is whether the city can directly revoke the grant, or itself use the streets in competition with the Water Company, in the face of its contract with the Water Company. The contract does not in terms express an agreement that the city will not, during the life of the contract, erect its own system for the purpose of supplying its inhabitants with water; but it can hardly be doubted that such is the fair implication and reasonable intendment of the contract. The City having induced the expenditure of money on faith of the promise that it would grant the exclusive use of the streets for the laying of pipes and mains by the Water Company, and having contracted to pay for the use of water for fire protection for a term of years, will not be permitted in equity to disregard its agreements by itself entering into ruinous competition with the other party before the expiration of the contractual term. South-west
Missouri Light Co. *v.* City of Joplin 101 Fed. 23, Walla
213 Walla *v.* Walla Walla, 172 U. S. 1, 43 Law Ed. 341.

"I conclude that the City may not prior to the expiration of the term for which it contracted for a supply of water for fire

protection, directly revoke the grant of the franchise for the use of its streets by the Water Company, or indirectly impair or destroy the value of the franchise by itself entering into competition with its grantee. To this extent the right is protected by the obligation of the contract entered into. St. Tammay Water Co., *v.* New Orleans Water Co. 120 U. S. 64; 30 L. Ed. 563; Louisville Gas Co. *v.* Citizens Gas Co., 115 U. S. 683; 29 L. Ed. 510; Bartholomew *v.* City of Austin, 85 Fed. 359."

The applicability of the language used by the master to the facts of this case is so apparent that it need not be discussed. As the report of the master in the Dawson case was in all things approved and confirmed in the circuit Court, it follows of course that the conclusions of law reached were satisfactory and met the full approval of the Court, and are in effect adopted as the law of that case. For that reason the quotations from the able report of the master have been given above.

On the facts of this case much evidence has been submitted by affidavits and by documents. This evidence has gone mainly to the issue made in the case as to whether there has been a compliance on the part of the Water Works Company with the terms of its
214 contract, and this relates to the original construction of the water works and as to the character and quantity of water furnished the city and its inhabitants since its construction. It cannot be doubted that there was a very serious condition in Columbus as to water supply during part of the year 1902, and this condition probably more than anything else led to the action of the City which gave rise to the present controvery. There has been an earnest attempt on the part of the bondholders acting through the Trust Company, complainant in this case, to remedy this condition; and it is not denied that its efforts have resulted in very great improvement in the quality of the water furnished.

In an amendment to the bill, on October 15th, 1903, complainant submitted: "That it is the purpose and desire of complainant and the bondholders of the Columbus Water Company represented by complainant as Trustee, to see that all proper and necessary steps are taken to furnish to the City of Columbus and its citizens an amply supply of pure and whol-some water and pressure in accordance with the contract and with the aid of this Honorable Court to perform and cause to be performed all of the obligations assumed by the Columbus Water Works under the contract mentioned and exhibited in the above stated bill of complaint.

"Complainant shows the court that the bondholders acting through their duly authorized bondholders committee have consented
215 and authorized this complainant to offer on their behalf to the court to have the present and future income of the said water works applied so far as may be necessary to the betterment of said system, and to have such further receiver's certificates made and sold as in the opinion of the Court will be adequate to furnish to the City and its citizens an ample supply of pure and whol-some water and adequate pressure for fire protection in accordance with the terms and requirements of the contract, and to postpone the lien of

the bonds to such receiver's certificates as the court may deem adequate and sufficient for the purpose; and complainant prays that a suitable reference be had to ascertain the probable cost of such improvements as to the Court may seem adequate and proper, and complainant prays that the court through proper orders will direct and require a specific performance both by the City of Columbus and the Columbus Water Works Company of the mutual agreements, covenants and obligations of the same contract. * * * if upon reference being had, the court should determine that further improvements are requisite and necessary, complainant is ready and willing and the bondholders of the said Columbus Water Works Company consent and agree that such additional improvements be made and paid for:

This is a very broad offer on behalf of the bondholders on whose behalf the trustee brings this bill. Their ability to comply with this offer has not been questioned. They have already expended in the filteration system, and otherwise improving the water works,
216 an amount said to be fifty thousand dollars. The amount of the bonded indebtedness is nearly four hundred thousand dollars. That this amount of indebtedness should be wiped out without careful investigation, will hardly be claimed by any one. It is certainly due the bondholders in view of their efforts to take up this contract with the Water Works Company and comply with it, that they should have a full and fair investigation before the property upon which they must rely as security for their debt, is destroyed. That the erection of another system of Water Works in the City of Columbus will go very far towards destroying the property, is manifest.

It is also due the City of Columbus that it should be allowed to show in the fullest manner its contention. The great importance of the matter to the City and its inhabitants requires this.

The contract between Thomas R. White and the City of Columbus, which subsequently became by agreement of the Mayor and Council of the City of Columbus a contract between the Columbus Water Works Company and the City, provided that "the source of water supply shall be determined by Thomas R. White, he guaranteeing, however, that the supply of water both in quality and amount shall be wholesome, constant and amply sufficient to meet the wants of the City and private consumers for future and present requirements." The City and its inhabitants are entitled under this con-
tract to an abundant supply of wholesome water, and this
217 sufficient to meet the wants of the city as it increases in population and areas. It is contended that this cannot be obtained from the present source of supply. The complainant proposes, as I understand it, to change this source of supply to one which is abundant and undoubted, and to do that immediately.

All the questions involved are serious and of the gravest importance, and they should not be disposed of on a preliminary hearing and on *ex parte* affidavits. It is due both parties that testimony should be carefully taken by examination and cross examination of witnesses. The case will be referred to a master for the purpose of a full investigation and report upon the questions of law and fact

involved. In the meantime, an injunction will be granted restraining the City of Columbus from taking further steps towards the sale of its bonds for the erection of a system of waterworks of its own.

This the 19th day of November, 1903.

WM. T. NEWMAN,
U. S. Judge.

MERCANTILE TRUST & DEPOSIT CO. OF BALTIMORE
vs.
THE CITY OF COLUMBUS ET AL.

This case being heard upon an application for injunction *pendente lite*, and the same having been argued and submitted, now,
218 upon consideration thereof it is ordered:

1. That this case be referred to Henry R. Goetchius, Esquire, Standing Master in Chancery for the Western Division of the Northern District of Georgia, for full investigation and report upon all the questions of law and fact involved.

2. That pending the hearing of this case and until the determination thereof, an injunction issue restraining the City of Columbus, the Mayor and Council thereof, their officers, servants, and agents from taking further action towards the issuance or sale of bonds for the purpose of establishing a water works system by said city.

This the 19th day of November, 1903.

WM. T. NEWMAN,
U. S. Judge.

Now comes the City of Columbus by its attorneys J. H. Martin, T. T. Miller, and Ellis, Wimbish & Ellis, and waives the issuing of injunction in the above stated case.

This 20th day of November, 1903.

T. T. MILLER,
J. H. MARTIN,
ELLIS, WIMBISH & ELLIS,
Solicitors for City of Columbus.

Filed in Clerk's office 20 Nov. 1903.

O. C. FULLER, *Clerk*,
By N. A. BROWN, *Deputy*.

219 *Order of Reference to Henry R. Goetchius, Esq., Standing Master in Chancery.*

Filed 8 Dec., '03.

In the Fifth Circuit Court of the United States for the Northern District of Georgia, Western Division. In Equity.

THE CITY OF COLUMBUS
vs.
THE MERCANTILE TRUST & DEPOSIT COMPANY OF BALTIMORE, Trustee, *et al.*

Cross Bill.

It appearing to the court that the cross bill filed by the City of Columbus in the above stated case has been answered by the different defendants, and the matters embraced in said cross-bill are at issue, it is ordered by the court that this case be referred to Henry R. Goetchius, Esquire, Standing Master in Chancery for the Western Division of the Northern District of Georgia, for full investigation and report upon all of the questions of law and fact involved.

This 8th day of December, 1903.

WM. T. NEWMAN,
United States Judge.

Filed in Clerk's Office 8 Dec., 1903.

O. C. FULLER, *Clerk.*
By N. A. BROWN, *Deputy.*

220 UNITED STATES COURT ROOM,
COLUMBUS, GA., *Feb'y* 4, 1904.

Mr. GARRARD: Does your Honor desire to dispose of that notice now? This was notice of city of Columbus for Complainants in original bill on the Receiver and the Water W'ks Co. to produce certain books and papers.

The MASTER: Yes, sir.

Mr. WIMBISH: We do not think the response to this notice is sufficient. Now the notice is as follows: (Reading notice) Now the response of Mr. Epping, President of the Water Works Company, is as follows: (Reading response to the Master) We call for certain books and certain documents that all corporations should have. It is difficult to conceive how a corporation could transact business without them, yet, this company simply gives a minute book of 1891 and say there are no other books within its knowledge, nor within its possession, custody or control. We think the corporation should explain that matter more in detail. * * * It should be more specific.

(Here argument followed by counsel for the complainant and respondent on the question of response to the notice served upon

the Columbus Water Works Company, or W. S. Greene, Receiver thereof, to produce certain books and papers.)

The MASTER: I rule that the answer or the response to this notice is not sufficient in detail; and that the company should answer more specifically as to the books and papers called for. I hold that the affidavit—sworn verification to the response by the president
221 would be sufficient, provided, the response stated what was not produced was neither in the custody, control or possession of the company, or any one of its officers; and that they were unable to account for them; that they were not in their possession, custody or control; that they were unable to produce them and unable to say where they were. I think that is sufficient. That is my ruling on this motion. When the answer comes in, if you gentlemen (the counsel for the City of Columbus, *et al.*), want anything further, you can proceed to get it like Judge Wimberly stated.

(Counsel for both sides here argued at length with reference to certain extracts from the Minutes of the City Council of Columbus, Ga., which the complainant wished to introduce in evidence; and which counsel for the City of Columbus, *et al.*, used on the hearing before Judge Wm. T. Newman. There was an effort made at an agreement between counsel in the case with reference to the introduction of said evidence; but failing to agree, counsel for complainant temporarily withdrew said evidence and introduced it later on, as will appear on page 381 of this record.)

Mr. GARRARD: You will consider the contract is in?

The MASTER: I will remind you, that this hearing, as you all know, is to be conducted just like a trial of any case; so let
222 your evidence come; and let the reporter list it as it comes. Then we will make some progress.

Mr. GARRARD: The copy attached to the original bill was furnished me by Mr. Moore, printed copy of the contract. There is an agreement there that the Clerk of the City Counsel must furnish a certified copy whenever asked for.

The MASTER: Do you offer the contract?

Mr. GARRARD: It is not the original, it is a copy.

Mr. WIMBISH: We simply want to know whether he offers the contract as attached to the bill. If he has the original we had rather have it; but if not we do not object to the copy.

Mr. GARRARD: If I find the original I will offer it.

Contract Between Thos. R. White and City Council of Columbus.

Contract.

Said contract being as follows:

STATE OF GEORGIA,
County of Muscogee:

Contracting Parties.

This is a contract made and entered into this 7th day of October, A. D., 1881, between Thomas R. White, of the City of Philadelphia,

State of Pennsylvania, and such other persons as may be associated with, or incorporated with him, and the mayor and council of Columbus, for the construction and operation of an effective system of water works for the supply of the city with water for the various uses required.

Thomas R. White, on his part, agrees to furnish and supply as hereinafter stated:

223 Real Estate and Water Rights.

I. All the real estate, rights of ways, water rights and water, that shall be found requisite for the successful prosecution and operation of the water works.

Buildings, Dams, etc.

II. To supply buildings, dams, embankments, of ample size and strength, good and durable quality, that may be required for the works.

Storage Reservoir—Elevation.

III. A storage reservoir for water having an available capacity for the storage and supply of not less than 125 millions of gallons of water when filled, so situated that the surface of water in such storage reservoir shall, when full, stand at an elevation of not less than 100 feet above the floor of the city market house; and if practicable, to have an elevation of one hundred and seven (107) feet, or more.

Supply Main.

IV. A water supply main of cast iron pipe, leading from the storage reservoir to the city, of ample capacity for water supply, which, in the beginning shall be of twelve (12) inches internal diameter; and shall supply the street mains at the pressure due to the elevation. It shall be properly placed, for the purpose intended.

Distribution System.

V. The distribution system in the city, shall, in the begin-
224 ning, consist of five (5) miles of street mains, of twelve (12), ten (10), eight (8), six (6), and four (4) inches, internal diameter, to be laid in such streets as Thomas R. White may select, with the consent of a special committee appointed by the City Council; particular reference being had to such a mode of distribution as shall give the greatest amount of fire protection to the city, and the distribution of the largest amount of water to consumers. The street mains shall be of the best cast iron, coated with coal tar varnish, and capable of standing a hydrostatic pressure of three hundred pounds to the square inch.

Stop Valves.

VI. The flow of water in the street mains shall be controlled by thirty (30 valves), distributed on the various sizes of pipes, at appropriate distances.

Fifty Double Hydrants for Fire.

VII. Fifty (50) double hydrants shall be placed on the original five miles of street distribution, making in all one hundred (100) hose connection. Both hydrants and valves to be first class workmanship. Hydrant connections to be four (4) inches and waterways of hydrants four (4) and four and one half (4½) inches. Proper provisions shall be made to guard against freezing in case of operation in use.

Drinking and Park Fountains.

VIII. Five (5) public drinking fountains shall be erected
225 at such points on the line of distribution as representatives of the council may direct; and one first class park fountain in the public park.

Sizes of Street Mains.

IX. The sizes of street mains shall be ample for supply to consumers and for fire protection through hydrants. The capacity for distribution and supply to various mains in streets to equal sizes given in plans for pipes, submitted to special committee of council previous to execution of this contract.

Water Supply.

X. The source of water supply shall be determined by Thomas R. White, he guaranteeing, however, that the supply of water, both in quality and amount, shall be wholesome, constant and amply sufficient to meet the wants of the city, and private consumers, for future and present requirements.

Filter for Water Distribution.

XI. Within the storage reservoir, and surrounding the supply main leading to the city, shall be constructed of masonry, two circular concentric walls arranged in annular positions, about twelve (12) feet distant from each other, and having an internal diameter for the inner wall of from forty (40) to fifty (50) feet, the outer having about twenty four (24) feet greater diameter. These walls to form a structure for containing between them, gravel, sand and filtering materials, through which all water supplied to the
226 water main shall pass before being distributed to the city.

Vegetable and Unwholesome Matter to be Removed.

XII. In constructing the storage reservoir all trees, stumps, roots, grass, alluvial deposits, vegetable and unwholesome matter shall be removed from the space to be occupied by water. Excavations and embankments shall be made about the margins of the reservoir such as will avoid all thin edges to the water, with reservoir filled, and cause marginal depths of not less than four (4) feet of water. After the completion of the reservoir, and the use of the water from the

same by the city, it shall be kept free from grass, weeds, vegetation of all kinds, aquatic or otherwise; and all proper and reasonable provisions made for cleanliness and purity. The filtering material surrounding the supply main shall be kept in good condition and cleanly.

Contaminated or Unwholesome Water—Experts.

XIII. Should the water supply to the distribution ever become contaminated or unwholesome, from any cause, upon notice being given by the proper city authorities, Thomas R. White agrees to make all provisions practicable for improving the quality; and if, at any reasonable time after such notice, the water supply is not of wholesome quality, to be determined by three scientific experts (one to be selected by the city, one by Thomas R. White, and the two to select a third), the city authorities may issue orders lim-
227 iting its use, or the entire cutting off of the water from the street mains, and reserve the use for fire purposes only. The expenses of such experts and examination to be paid by Thomas R. White, or the city, whichever may be decided against; and if no decision, each to pay its expert and both to pay the third.

Franchise—Rental of Fire Hydrants.

XIV. The Mayor and council are to grant a franchise for the exclusive privilege of maintaining and operating the works for a period of thirty (30) years; or until such time as they may be purchased by the city; and during such time to rent from Thomas R. White, the fifty (50) double fire hydrants at an annual rental of eighty (80) dollars each, equal to four thousand ($4,000) dollars per year, payable quarterly; and on future extensions the rate shall be seventy five (75) dollars per hydrant; but whenever the number of hydrants exceed ten (10) per mile, on any one mile of pipe, there shall be a discount of ten per cent. for each additional hydrant on said mile of pipe. In the primary distribution of the fifty hydrants on the line of street mains, reference shall be had to the value of property contiguous, and a number of hydrants greater than ten may be placed on a mile of pipe without this reduction in price per hydrant, until additional hydrants beyond fifty (50) are placed on the original five miles of pipe, when such reduction shall
228 occur on one hydrant for each such addition.

Payment of Water Rents.

XV. In order to make provisions for the payment of water rents, the Mayor and council, in making appropriations for the fire and sanitary departments, shall appropriate a sum sufficient to pay the annual rental of the water works, and the Mayor and council shall receive in payment for any taxes due the City of Columbus the due coupons of any bond issued by Thomas R. White, to an amount not exceeding the rental due by the city to him in any one year; and the coupons thus taken shall be received by him as cash in payment of said rentals.

Rates to Private Consumers, or Annual Charges.

XVI. Thomas R. White may charge and collect from private consumers, not to exceed the following rates: For an average daily consumption of less than five hundred (500) gallons, five cents per hundred gallons; from five hundred (500) to two thousand (2000) daily average, four (4) cents per hundred gallons; from two thousand (2000) to five thousand (5000) daily average, three (3) cents per hundred gallons; over five thousand (5000) daily average, two and one half (2½) cents per one hundred gallons, or, instead of above rates, annual charges may be made to consumers, for use, based on consumption, prices not to exceed those mentioned in this section.

229 Free Water to City in Lieu of City Taxes.

XVII. The city shall have the right to free use of water for four sprinkling carts or wagons, to be taken from the line of distribution, for engine practice, for the park fountain, for the drinking fountains, for the court house or city hall, engine houses and public schools, and in consideration of this use or water, the city shall pay Thomas R. White a sum annually equal to the city taxes on the water works property, stocks, bonds and franchises due said city.

Charges to City for Water.

XVIII. The price to be paid by the city for water, other than for sanitary purposes, and that supplied in lieu of taxes, and not otherwise herein provided for, shall be at a rate not exceeding two (2) cents per one hundred gallons for the amount actually used.

Filling Public Cisterns.

XIX. The city authorities may select any number of public cisterns, which they may desire to be kept supplied with water from the fire hydrants, and such cisterns, when so designated, may be, from time to time, filled by the fire department, by means of hose, for the purpose of extinguishing fires, and for engine practice; and for water thus furnished the city shall pay an annual rental of fifteen (15) dollars for each cistern so designated, or the water may be paid for at the rate of two cents per one hundred
230 gallons.

Flooding Streets or Sewers—Charges—Rates.

XX. Whenever, in the opinion of the proper city authorities, for sanitary purposes, it shall be deemed expedient to wash or flood the streets, drains, ditches or sewers, contiguous to fire hydrants, on one day's notice being given Thomas R. White, any fire hydrant may be used for such purposes, directly or by means of hose, or connections, provided such use is not beyond the capacity of the works to supply. For each fire hydrant so used the city shall pay forty (40) cents per hour for water supplied through each hose, and

one dollar and forty ($1.40) per hour if supplied directly from fire hydrants.

Reservation to City of Pipes, etc., Now in Use.

XXI. The Mayor and council reserve the right to the undisturbed use of the four inch water-pipe connections and attachments, now located on Broad, Randolph and Front Streets, for fire purposes only, the supply of cisterns, and engine practice. Said water pipe not to be used for other water supply, or street sprinkling, after the completion of the water works, except with the consent of Thomas R. White.

Interruption of Supply.

XXII. Should Thomas R. White find it necessary at any time to cut off the water from any or all of the supply mains, deductions in charges for water supplied shall be made, both to the city and to consumers, so deprived of its uses or benefits, equal to double
231 what would have been due during such time, to Thomas R. White, had not such interruption in supply occurred; provided that a temporary stoppage in the supply, not exceeding twelve (12) hours' duration, at any one time, for the purpose of repairing, extending or tapping water mains, shall not be considered an interruption for rebate.

Depth for Pipes in Ground.

XXIII. Water mains and pipes located in streets shall be placed an average depth of not less than three (3) feet below the surface. Fire hydrants, valves and attachments shall be properly guarded against freezing; valve wells properly guarded, both for safety of the public and the proper operation of the valves.

Uniform Hydrants—Uniformity of Valves.

XXIV. All hydrants for attaching city regulation fire hose, both public and private, shall be uniform in size of openings, the threads on the same cut to fit couplings on hose now in use by the fire department. All attachments for opening hydrant valves to be of uniform size, relative to opening and closing. The operating heads or squares of all stop valve stems in the water main system shall be uniform size, relative to means of opening.

Direction of Opening Uniform.

Every valve, of every description, whether hydrant, gate or stop valve, shall have an uniform direction or rotation in opening said valves, namely: to turn against the sun in opening, and to
232 close by the reverse direction of rotation.

Private Fire Hydrants—Annual Rentals.

XXV. Any citizen or citizens having property interest contiguous to the line of any street main may have a private hydrant, uniform

in construction and details with those rented by the city of Thomas R. White, placed at or near the street line of sidewalk, (this location to be with approval of city council), or on the premises, said citizen or citizens paying to Thomas R. White the full cost of purchasing and placing the same, if placed by him, or cost of any portion of same so placed by him, and paying, in advance, an annual rental of twenty-five ($25.) dollars for single, or forty ($40.) — for double hydrants. Such private fire hydrants to be used for fire purposes only, except by special arrangement with Thomas R. White. Private fire hydrants thus provided, if located on streets, may be used by the city fire department for extinguishing fires contiguous; preference being always given to protection of property belonging to subscriber- for the hydrants. On failure of such subscribers for private fire hydrants to pay on demand, in advance, the charges for rental on the same, Thomas R. White may cut off the water and the ownership of so much of the hydrants and attachments as is located on the street, revert to Thomas R. White.

233 Rental of Hydrants after Fifteen Years.

XXVI. After the expiration of the term of fifteen (15) years, succeeding the acceptance by the city of the water works, under this contract, if at that time the city does not become the purchaser of the same, the annual rental charges to the city for all fire hydrants thereafter, on all future extensions, shall be reduced to one half the prices now agreed upon; but the original rates shall be continued on all hydrants, on the distribution existing at that date.

Insufficient Water Pipes.

XXVII. Whenever the consumption of water on the line of any street main is so great as to reduce the pressure, between the hours of nine (9) and ten (10) o'clock, A. M., and one (1) and two (2) o'clock P. M., below thirty two pounds to the square inch, said water main shall be deemed of insufficient capacity, and shall be replaced by Thomas R. White with pipes, mains, or connections, of sufficient size to give the pressure above named; the level of the market house floor to be taken as the index for levels and pressures.

No Pipe Less Than Four Inches.

No water main of less than four (4) inches diameter shall be used in the distribution system.

Extension of Water Mains.

XXVIII. Thomas R. White obligates himself to extend mains wherever he shall be assured of a permanent annual income
234 of $700. per mile of pipe, or $150. a year on a line of 1000 feet, or $100. on a line of 600 feet.

These incomes when the pipes laid may be of four (4) inches diameter, with fifty (50) per cent. additional assured income when

six inches is to be laid, either direct or indirectly, to supply the same in lengths not exceeding those mentioned.

Location of Fire Hydrants.

XXIX. The fire hydrants shall be located along the streets where the pipes are laid, and their location shall be with the approval of a special committee appointed by the council.

Interferences.

XXX. In laying water mains, service or other pipes, should existing positions of gas or other pipes, sewers, public or private improvements, present obstructions to laying the same, the determination as to position and rights shall be vested in the city council relative to water mains, and Thomas R. White shall conform to this decision.

Relaying Water Pipes.

XXXI. Whenever, owing to change of grades of streets, crossings or public improvements, water mains or pipes have to be re-laid, the work of so doing shall be promptly executed at the expense of the city.

Use of Streets—Obstructions and Streets.

XXXII. Previous to laying water pipes on any streets,
235 Thomas R. White shall have the right to distribute the sections of pipes and fittings on the surface of such street, and occupy for a reasonable time so much of the street as shall be required for the same; but in so doing due regard for public convenience shall be had; and the least practicable obstructions to the streets, crossings and private ways. Whenever undue obstructions are so presented, on notice being given by the proper city authorities, the same shall be removed.

Public Convenience—Public Safety.

XXXIII. In excavations, embankments and incidents to laying water or service pipes, due regard to public and private convenience shall be observed, and the least practicable obstructions prevented. When practicable, crossings and passages shall be provided for vehicles and persons. In excavating ditches for laying water pipes and in the use of streets for distributing sections of pipes previous to laying and the like, due regard to public safety shall be observed; and Thomas R. White shall use such safeguards against accidents in the public use of streets sidewalks, crossings and private ways, both during the day and night as will avoid endangering life or limb of citizens or animals.

Damages to Streets—Negligence.

XXXIV. When damage to streets, etc. occurs from leakage or the breakage of mains or fire hydrants, connections or service
236 pipes in streets, the same shall be promptly repaired by Thomas R. White, at his own expense, unless such damage

shall be caused by the negligence or wilfulness of the fire department, or other city employees.

Damages.

XXXV. Thomas R. White shall at all times, save and keep the city harmless from all damages that may arise from excavating or filling the streets in the construction and maintaining the water works.

Streets Restored.

XXXVI. After the use of streets and highways for laying pipes and placing hydrants, the same shall be restored, as near as practicable, to as good condition as before such use.

Public Water for Private Use.

XXXVII. Public fountains are not to be used for private purposes, neither other public water, except by the joint consent of the city and Thomas R. White, except, also, as intended in this contract.

Hitching Posts—Illicit Uses and Malicious Mischief.

XXXVIII. The Mayor and council agree to enact an ordinance, making it a misdemeanor, punishable by a fine not exceeding ten ($10) dollars for each offense for any person to make use of a public or private fire hydrant as a hitching post for horses, mules or other animals, and will also protect by legislation, valves and hydrants against illicit uses and malicious mischief.

237 Additional Legislation.

XXXIX. The Mayor and council shall aid in procuring such additional State and municipal legislation as may be requisite to protect the rights and property of Thomas R. White.

Works to be of Ample Capacity.

XL. The proposed works shall be built in the most substantial manner and of the best materials, and on such a scale as to permit the extension of the pipes and an enlarged supply for the future without remodeling or altering the machinery or street mains for many years to come, under ordinary conditions.

Certified Copies of Contract.

XLI. The Mayor and council will authorize the city clerk to furnish Thomas R. White certified copies of this contract, or any portion of the same, to whatever number may be desired, when so requested.

Purchase of Water Works After Fifteen Years—Arbitration—Purchaser Assuming Obligation.

XLII. The Mayor and Council shall have the right at the end of Fifteen (15) years from the completion of the works to buy the same, with all the rights, franchises and property belonging thereunto, at a price that may be mutually agreed upon by the parties, or the valuation may be ascertained by three disinterested parties, non-residents of Columbus or the county of Muscogee, and one of whom shall be a well known hydraulic engineer—one of the said
238 parties to be chosen by the city, one by Thomas R. White and these two to select a third. When these three persons shall declare the value of the water works, the city shall pay the sum named, with ten (10) per cent. added to the amount for which the works have been valued; and the city shall, in this purchase, assume all the obligations of Thomas R. White, the lawful acquittances of which shall be received by Thomas R. White as a part of the cash payment of the declared value of the water works. These obligations include such as are for operating, maintaining and extending the same, the duties incident thereto. In assuming money obligations for indebtedness, or choses in action, due from Thomas R. White, to others, the same shall be in lieu of cash payments to equal amounts, and no obligation to assume money liabilities greater than the value to be paid by the city.

May Decline Purchase.

But the Mayor and council shall have the right to decline the purchase of the works, after the value may have been declared, upon the payment by them of the cost and expenses of the arbitration.

Right to Purchase Every Fifteen Years. Notice.

In the event of the city not making the purchase the rights and privileges of Thomas R. White shall continue in force until the final purchase of the works by the city; and the right to purchase shall enure to the city every fifteen (15) years; but in every case it shall give to Thomas R. White twelve (12) months previous notice of its intention to purchase.

239 Defective Plumbing.

XLIII. Whenever, by reason of defective plumbing, workmanship or material, used by consumers in fitting, considerable unnecessary water waste shall occur on the premises, after due notice being given by Thomas R. White, he may cut off the water from such consumer until the proper repairs are caused to be made.

Putrid Water on Private Property—City May Order Supply Cut Off.

XLIV. In the use of water by consumers, should the waste or drain from any premises be allowed to flow or waste on a private property, and become obnoxious, stagnant, putrid or uncleanly; if, after due notice being given by the proper city authorities to such

consumer, the obnoxious or improper condition are allowed to remain, the city may, upon notice to Thomas R. White have the water supply to such premises shut off until the consumer shall comply with the notice and remove the nuisance.

Distributing Reservoir May Be Used—Not Less Than 3,000,000 Gallons Capacity—Pumps—Filtering Water—Elevation.

XLV. In the execution of this contract by Thomas R. White, should the gravity system contemplated be found impracticable, either owing to natural causes, objections or unreasonable requirements of land owners regarding the right of way for the pipe leading to the city, a well-constructed secondary or distributing
240 reservoir may be used of not less than 3,000,000 gallons capacity; and two full systems of pumps, operated by either water or steam power, may be used for elevating water from the storage to the distributing reservoir. Such pumps to be first class of easy capacity of not less than 1,500,000 gallons daily, to be capable of being worked separately or together; pumpings connections between the reservoirs to be twelve inches or more and proper valves and attachments used; filtering arrangements in storage reservoir, as heretofore described. The elevation of distributing reservoir to be not less than twenty feet above storage reservoir. Such distributing reservoir to be kept well supplied with water, in good condition in every way, and all arrangements consequent to distributing reservoir being used and adopted, shall be provided by Thomas R. White.

Time for Beginning and Completing Water Works.

XLVI. After the full execution of this contract by the city and Thomas R. White, and ratification of the contract by city council, Thomas R. White obligates himself to begin material work within twenty days, and within that time to be personally present in the supervision of the same, and to continue the work with only such intermissions as shall occur from Providential causes, to completion; with a view to the full operation of the same by May 1st, A. D., 1882. He will procure all necessary real estate, water rights,
241 rights of way and leasements, proceed to building the storage reservoir as early as possible as well as the distributing reservoir, should one be found necessary. He will contract for and ship to Columbus, within two (2) months, two thousand (2000) feet of twelve (12) inch water pipe for use in the supply main.

Forfeiture for Failure—Revert to City.

XLVII. If the provisions of this contract for constructing the water system shall not be commenced to be *bona fide*, executed by Thomas R. White and material progress made within thirty days following the signing and execution of this contract, or not to be completed previous to June 1st, A. D., 1882, the rights here invested by the Mayor and city council in Thomas R. White, shall revert to the city; and all property, real or chattel, and rights procured by him

for building the water works shall be forfeited to the city; and any damage to the streets, public or private property, by reason of incomplete work, or failure to do the same properly, shall be repaired at the expense of Thomas R. White.

Holly System.

XLVIII. Should natural causes or unreasonable requirements of owners of real estate required in construction, render the building of a storage reservoir at an elevation above 110 feet impracticable then, if deemed expedient, Thomas R. White may adopt what is known as the Holly Syste-, of water works in lieu of other
242 systems. In this event a storage reservoir of not less than fifty million gallons capacity shall be provided. Pumps and boilers of ample capacity in duplicates. Arrangements shall be made for domestic pressure, equal to not less than that due to one hundred feet elevation and a fire pressure of not less than that due to one hundred and fifty feet. Direct electric communication from fire alarm station of city to pump house with proper arrangements for early fire pressure in case of an alarm. As far as this system can be made to conform with provisions hereinbefore set forth, it shall be so done in the use of a Holly System.

In testimony whereof, Thomas R. White and the Mayor and council of Columbus have hereunto set their hands and seals the day and year hereinbefore mentioned and written.

Witnesses as to the signature of Thomas R. White, John N. Barnett, B. H. Hudson.

THOMAS R. WHITE.	[SEAL.]
F. G. WILKINS, *Mayor.*	[SEAL.]
JOHN HILL.	[SEAL.]
R. B. MURDOCH.	[SEAL.]
W. R. BROWN.	[SEAL.]
J. A. SHINGLEUR.	[SEAL.]

243 *Mortgage of Columbus Water Works Co. to Secure Issue of $100,000. of Bonds.*

Mr. GERRARD: I offer certified copy of mortgage made by The Columbus Water Works Company to the Guarantee Trust and Safe Deposit Company, Trustee, etc.

Said mortgage being as follows:

"The Columbus Water Works Company

to

Guarantee Trust and Safe Deposit Company, Trustee, etc.

This indenture made and entered into, this the first day of May, in the year of our Lord One Thousand Eight Hundred and Eighty Two (1882), between the Columbus Water Works Company of Columbus, Muscogee County, Ga., a corporation chartered under and

by virtue of the laws of the State of Georgia, party of the first part, and the Guarantee Trust and Safe Deposit Company, of Philadelphia, Pennsylvania, Trustee, as hereinafter set forth, of the second part,

Whereas, the stockholders of the party of the first part, at their regular meeting on the 11th day of April, A. D., 1882, duly adopted the following resolution, a majority of them, both in numbers and value of stock, voting for its adoption:

"Resolved by the Columbus Water Works Company in stockholders meeting assembled, that the Columbus Water Works Company for the purpose of funding its indebtedness and raising and supplying funds for the completion of its water works, upon the construction of which it has already entered, make and issue its First Mortgage Bonds to the amount of One Hundred Thousand Dollars,
to-wit: Two Hundred Bonds of Five Hundred Dollars each,
244 said bonds to be dated the first day of May, 1882, and to mature Twenty Years thereafter, bearing interest at the rate of six per cent. per annum semi-annually on the first days of November and May in each year, at the Guarantee Trust and Safe Deposit Company of Philadelphia, Pennsylvania, in the lawful money of the United States, on presentation of the coupons attached to said bonds, redeemable at the option of the Company on and after the first day of May, 1882.

And further be it resolved, that to secure the payment of the principal and interest of said bonds, a first mortgage upon the water works of the Columbus Water Works Company, together with its lands, machinery, pipes, outfit, properties, rights, privileges, franchises, tolls, incomes, rents, issues and profits now held and hereafter acquired by it, is hereby directed to be made, executed, delivered and recorded in due form of law to the Guarantee Trust and Safe Deposit Company of Philadelphia, Pennsylvania, as Trustees.

And further resolved, that the Board of Directors be and the same are hereby authorized to dispose of said bonds at a price not below par, and carry out the purposes of this resolution.

And whereas, in pursuance of said resolutions there have been prepared and made ready for issue Two Hundred Coupon Bonds numbered consecutively from One to Two Hundred, both numbers inclusive, all being equal and alike except as to numbers, and bearing even date herewith, with coupons for interest attached to each, forty in number, and the coupons consecutively and correspondingly numbered matured which bonds and coupons are in form as follows:

245 UNITED STATES OF AMERICA.

No. —. *State of Georgia.* $500.

The Columbus Water Works Company First Mortgage Bonds.

The Columbus Water Works Company, a corporation duly organized and existing under the laws of the State of Georgia, for value

received, hereby promises to pay to the bearer, the sum of Five Hundred Dollars, lawful money of the United States of America on the first day of May, in the year of our Lord, Nineteen Hundred and Two, together with interest on the said sum from the date hereof at the rate of six per centum per annum, payable semi-annually on the first days of November and May of each year, at the office of the Guarantee and Safe Deposit Company, in the City of Philadelphia, Pennsylvania, on presentation of the coupons hereto attached as they severally become due.

This Bond is one of a series of Two Hundred, numbered consecutively from One to Two Hundred, both numbers inclusive, each of the denomination of Five Hundred Dollars, all being of like tenor and date secured by first mortgage upon the water works of the said The Columbus Water Works Company, in the City of Columbus, County of Muscogee and State of Georgia, and in the County of Lee and County of Russell, in the State of Alabama, together with its lands, machinery, pipes, outfit, properties, rights, liberties, privileges and franchises, and all the tolls, incomes, rents, issues and profits now held or hereafter to be acquired by it, executed by it to the Guarantee Trust and Safe Deposit Company of Philadelphia, Pennsylvania, Trustee, dated the first day of May, A. D., 1882, and
246 duly acknowledged and recorded according to law in the proper Probate office of the County of Muscogee and State of Georgia and in the Counties of Lee and Russell, in the State of Alabama.

This Bond is redeemable at the option of the company at par and accrued interest on and after the First day of May, A. D., 1892. This bond shall not become obligatory until authenticated by the signature of the proper officers of the said Guarantee Trust and Safe Deposit Company, Trustee, to the certificate hereon endorsed.

In witness whereof, the said The Columbus Water Works Company has caused this instrument to be sealed with its Corporate Seal, attested by the signature of its President and Secretary and the coupons hereto attached to be signed by its Treasurer, this the first day of May, A. D., 1882.

—— ——, *President.*

Attest:

—— ——, *Secretary.*

(Certificate Endorsed on Bond.)

The Guarantee Trust and Safe Deposit Company hereby certify that the within Bond is one of a series of Two Hundred Bonds of Five Hundred Dollars each secured by the mortgage therein mentioned.

GUARANTEE TRUST AND SAFE DEPOSIT COMPANY, *Trustee,*

By —— ——, *President.*

(*Coupon.*)

The Columbus Water Works Company will pay to bearer on the — day of ——, Fifteen (15) Dollars, on presentation of this coupon, at the office of the Guarantee Trust and Safe Deposit Company, in the City of Philadelphia, Pa., for semi-annual interest on this mortgage bond.

No. —.

—— ——, *Treasurer.*

247 Now this indenture witnesseth:

That for the purpose of securing the prompt and ultimate payment of the aforesaid bonds and coupons, and for and in consideration of the premises, as well as the sum of ten dollars to the said, the Columbus Water Works Company, paid by the said Guarantee Trust and Safe Deposit Company, Trustee as aforesaid, the receipt whereof is hereby acknowledged, the said, the Columbus Water Works Company hath granted, bargained, sold, aliened, enfeoffed, released, confirmed, and by these presents doth grant, bargain, sell, alien, enfeoff, release and confirm*ed* unto the said Guarantee Trust and Safe Deposit Company, trustee as aforesaid, its successors and assigns, the Water Works of the Columbus Water Works Company, situate in Muscogee County, State of Georgia, and in Lee and Russell Counties, in the State of Alabama, together with its lands, machinery, pipes, outfit, properties, rights, liberties, privileges, franchises, tolls, income, rents, issues and profits now held or hereafter to be acquired by it.

To have and to hold the same to the party of the second part its successors and assigns forever, In Trust, and upon the following conditions, to wit:

That the said party of the second part upon the failure of the said The Columbus Water Works Company to pay any of the aforesaid Bonds or Coupons when the same shall have become due and
248 payable and shall continue so for the space of three consecutive months, and upon the request in writing of any *bona fide* holder and owner of said bond and coupons, to said party of the second part; the said party of the second part shall at its option, foreclose this mortgage by suit at law, or in equity, or shall be empowered and required to enter upon said real estate and take possession of the same and also all the other property of the every character and description herein conveyed without process of law, and shall sell the same, or so much thereof, as may be necessary, at public outcry to the highest bidder, upon such terms and at such times and places as the said trustee as -foresaid may deem for the best interest of said bondholders, after having given thirty days notice of the terms, time and place of sale, in a public gazette in Columbus, Georgia, and in Opelika, Alabama, and after entering on said lands, and assuming possession of any or all of the aforesaid property, the said Trustee, as aforesaid may continue and carry on the business of the said water works company until the sale or disposition of said property; and upon the sale of the real and personal property as herein described and provided for, the said Trustee as

-foresaid, is hereby fully authorized and empowered to convey the same by proper and sufficient conveyances to the purchasers, their heirs, and assigns absolutely, and to put them in possession thereof.

So long as the party of the first part shall retain possession
249 and control of said property and franchises, and of its tolls, incomes, rents, issues, and profits, it shall pay all taxes, levies, charges, rates and assessments which shall or may be legally imposed, assessed or levied upon the property and franchises hereby conveyed and attempted to be conveyed, and will take care of and preserve the same, and at its own cost will do all acts necessary and proper to keep valid the lien hereby created, and intended to be created, and will act at any future time and as often as may be necessary execute all such other assurances, deeds, mortgages, or other instruments of writing as may be proper to the better carrying out the true intent and meaning of these presents, and will especially and at its own cost, do all things that may be reasonably required to make and keep valid the lien herein intended to be created upon after acquired property.

And it is expressly understood and agreed, that on and after the first day of May, A. D., 1892, the party of the first part may redeem all the said bonds then outstanding and any part thereof, at par and accrued interest. Upon default of payment of the coupons on said Bonds as hereinbefore specified and the seizure and sale of the property as set forth, thereupon the principal of all of said bonds shall be held, and considered as due; and the said party of the second part, after the payment of the expenses of said seizure and sale, and a reasonable commission or compensation to them-
250 selves for the execution of the said trust, shall appropriate the balance of the proceeds of said sale to the payment of the coupons then due, and unpaid, and then the remainder, if sufficient, shall be paid in extinguishment of said bonds, and if not sufficient shall be paid pro rata upon said bonds, and in no event giving preference to one over another of said bondholders.

And if any balance shall remain after payment of this indebtedness, the same shall be paid to the said The Columbus Water Works Company.

In the event of the death, disability, removal or resignation of any Trustee, the party of the first part shall petition the Superior Court of Muscogee County, in the State of Georgia, for the appointment of a successor, bringing before said court all the holders of the bonds then outstanding known to the party of the first part by actual or constructive service and the Trustee or Trustees shall by said appointment be clothed with all the rights, powers and privileges and subject to all the duties conferred by this mortgage upon the party of the second part.

It is hereby further covena-ted and agreed and the Trusts herein created are accepted upon the express condition that the said parties of the second part or any of their successors, shall not incur any liability or responsibility whatever by reason of the permitting or suffering the said party of the first part, their successors or assigns

to have, retain, control, manage or enjoy the above mentioned
251 mortgaged premises or any part thereof, nor shall the said parties of the second part, or their successors, be liable or responsible for any destruction, deterioration, injury, damage, sale, assignment or transfer, that may be done, occur, be made of or to the same, nor shall they be liable or responsible for or by reason of a breech by or in the party of the first part, its successors or assigns, of any covenant or agreement herein contained, nor shall said parties of the second part be liable or responsible for any matter, cause or thing, except an intentional breach or breaches of the trusts herein expressly vested in, and conferred on them.

And the said Columbus Water Works Company unto the said Guarantee Trust and Safe Deposit Company, Trustee, as aforesaid, and its successors in Trust, the herein bargained property will warrant and defend against themselves and against the claims of their successors and assigns and against the claims of all other persons whatsoever.

Provided nevertheless, that the said Columbus Water Works Company, its successors and assigns, shall and do well and truly pay or cause to be paid unto the said owners and holders of said bonds and coupons, the amounts due and payable thereof, on the days and times mentioned and appointed for the payment thereof, then this said indenture, from then and thenceforth, as well as the right of property herein conveyed, shall cease and determine and be void to all intents and purposes.

252 In witness whereof, the said The Columbus Water Works Company has hereunto caused its common or Corporate Seal to be affixed, this the First Day of May, in the year of Our Lord, One Thousand Eight Hundred and Eighty Two (1882).

BENJAMINE F. ARCHER, *President.*

Attest:

[SEAL.] THOS. W. SYNNOTT, *Treas.*

Sealed and delivered in the presence of us:

CHARLES E. PANCOAST.
SAMUEL L. TAYLOR.
Commissioner for Georgia and Alabama.

STATE OF PENNSYLVANIA,
City and County of Philadelphia, ss:

Be it remembered that on the Twenty Fourth (24th) day of May, in the year of Our Lord, One Thousand Eight Hundred and Eighty Two (1882), before me, the Subscriber, a Commissioner of Deeds for the State of Georgia, residing in the said City of Philadelphia, personally appeared the above named Benjamine F. Archer, President, and Thomas W. Synnott, Treasurer of Corporation, who have signed the foregoing deed, and acknowledged that they signed, sealed and delivered the same as the voluntary act and deed of the Columbus Water Works Company of Columbus, Muscogee County, Georgia, for the uses and purposes therein mentioned, and that the

seal affixed thereto is the Common or Corporate Seal of the said Corporation.

253 And there further appeared before me Charles E. Pancoast, a subscribing witness to the foregoing conveyance, known to me, and being sworn, stated, that the Columbus Water Works Company, the grantors in the conveyance, by Banjamine F. Archer, their President, and Thomas W. Synnott, their Treasurer, voluntarily executed the same in his presence and in the presence of the other subscribing witness on the day of the date hereof, that he attested the same in the presence of the said President and Treasurer and of the other witness, and that such other witness subscribed his name as a witness in his presence.

Given under my hand and offical seal, this 24th day of May, A. D., 1882.

[SEAL.] SAMUEL L. TAYLOR,
Commissioner for Georgia.

STATE OF PENNSYLVANIA,
City and County of Philadelphia, ss:

Be it remembered that on the 24th day of May, in the year of our Lord, One Thousand Eight Hundred and Eighty Two (1882), before me the subscriber, a Commissioner of Deeds for the State of Alabama, residing in the City of Philadelphia, personally appeared the above named, Benjamine F. Archer, President, and Thomas W. Synnott, Treasurer of said Corporation, being personally known to me, and who have signed the foregoing deed, and acknowledge that they signed, sealed and delivered the same as the voluntary

254 act and deed of the Columbus Water Works Company of Columbus, Muscogee County, Georgia, for the uses and purposes therein mentioned; and that the seal affixed thereto is the Common or Corporate Seal of the said Corporation.

And there further appeared personally before me Charles E. Pancoast, a subscribing witness to the foregoing conveyance, personally known to me, and being sworn, stated, that the Columbus Water Works Company, the grantors in the conveyance by Benjamine F. Archer, their President, and Thomas W. Synnott, their Treasurer, voluntarily executed the same in his presence and in the presence of the other subscribing witness on the day of the date thereof; that he attested the same in the presence of the said President and Treasurer and of the other witness, and that such other witness subscribed his name as a witness in his presence.

Given under my hand and official seal this the 24th day of May, A. D., 1882.

[SEAL.] SAMUEL L. TAYLOR,
Commissioner for Alabama.

The Guarantee Trust and Safe Deposit Company do hereby accept the trust in said above Mortgage created and upon the terms and conditions therein specified.

[SEAL.] THOMAS COCHRAN, *President.*

255 Recorded June 2nd, 1882.

GEO. Y. POND, *Clerk.*

properties, rights, liberties, privileges, franchises, tolls, income, rents, issues and profits now held and hereafter to be acquired by it, is hereby directed to be made, executed and delivered and
259 recorded in due form of law to the Guarantee Trust and Safe Deposit Company of Philadelphia, Penna., as Trustee; And further Resolved that to carry out the purposes of this resolution, Mr. George W. Bailey be appointed a Committee to obtain the assent of the holders of the Bonds issued under the present mortgage of the Company dated May 1st, 1882, to the surrender and destruction of said Bonds upon their receiving therefor Bonds of like tenor and amount at their par value issued under and secured by the mortgage of the Company authorized in this resolution, and that a Committee composed of the Board of Directors be further authorized to appear for and represent the Columbus Water Works Company at the surrender and destruction of the Bonds now Outstanding under the said mortgage of May 1st, 1882, and the issue to the respective holders at par value of new Bonds therefor as aforesaid, and that said surrender, distribution and issue shall be made and effected at the Office of the said Guarantee Trust and Safe Deposit Company, Trustee.

And Whereas, in pursuance of said resolution there have been prepared and made ready for issue Two Hundred Coupons Bonds, numbered consecutively from One to Two Hundred both numbers inclusive, One hundred for the sum of Two Hundred Dollars each and One Hundred for the sum of One Thousand Dollars each, all being alike save as to numbers and amounts, and bearing even date herewith with Coupons for interest attached to each forty in
260 number and the Coupons consecutively and correspondingly numbered and matured which bonds and coupons are in form as follows:

No. —.

UNITED STATES OF *Georgia*.

First Mortgage Bond.

The Columbus Water Works Company.

The Columbus Water Works Company, a Corporation duly organized and existing under the laws of the State of Georgia for Value received hereby promises to pay to the bearer the Sum of —— Dollars lawful money of the United States of America, on the first day of November in the year of our Lord One Thousand Nine Hundred and Eight, together with interest on said sum from the date hereof at the rate of Six per centum per annum, payable semi-annually on the first day of May and November of each year at the Office of the Guarantee Trust and Safe Deposit Company in the City of Philadelphia, Pennsylvania, on presentation of the Coupons hereto attached as they severally become due.

This bond is one of a series of Two Hundred numbered consecutively from One to Two Hundred both numbers inclusive, One Hundred of the denomination of Five Hundred Dollars each and

One Hundred of the denomination of One Thousand Dollars each, all being of like tenor and date, secured by first Mortgage upon the Water Works of the said, the Columbus Water Works Company in the City of Columbus, County of Muscogee and State of Georgia; and in the County of Lee, and County of Russell, in the State
261 of Alabama: Together with its lands, machinery, pipes, outfit, properties, rights, liberties, privileges and franchises, and all the tolls, income, rents, issues and profits now held or hereafter to be acquired by it to The Guarantee Trust and Safe Deposit Company of Philadelphia, Pennsylvania, Trustee, dated the First day of November, A. D. 1888, and duly acknowledged and recorded according to law in the proper Probate Office in the County of Muscogee and State of Georgia, and in the Counties of Lee and Russell, in the State of Alabama. This Bond is redeemable at the Option of the Company at par and accrued interest on and after the first of November, A. D. 1898.

This Bond shall not become obligatory until Authenticated by the signature of the proper Officers of the said Guarantee Trust and Safe Deposit Company Trustee, to the Certificate hereon endorsed.

In Witness Whereof, the said the Columbus Water Works Company has caused this instrument to be sealed with its corporate seal, attested by the signatures of its President and Secretary and the coupons hereto attached to be signed by its Treasurer, this First day of November, A. D. 1888.

—— ——, *President.*

Attest:

—— ——, *Secretary.*

(*Certificate Endorsed on Bond.*)

The Guarantee Trust and Safe Deposit Company hereby certifies that the within Bond is one of a series of Two Hundred Bonds
262 100 of Five Hundred Dollars each, and One Hundred of One Thousand Dollars each, secured by the Mortgage thereon mentioned.

GUARANTEE TRUST AND SAFE DEPOSIT COMPANY, *Trustee,*
By —— ——, *President.*

(*Coupon.*)

The Columbus Water Works Company, Will pay to bearer on the — day of —— A. D. ——, ($—) — Dollars, on presentation of this Coupon at the Office of the Guarantee Trust and Safe Deposit Company, in the City of Philadelphia, for semi-annual interest on this Mortgage Bond, No. —.

—— ——, *Treasurer.*

Now, This Indenture Witnesseth, that for the purpose of securing the prompt and ultimate payment of the aforesaid bonds and coupons and for and in consideration of the premises as well as for the sum

of Ten Dollars lawful money, to the said, the Columbus Water Works Company paid by the said Guarantee Trust and Safe Deposit Company, Trustee, as aforesaid, the receipt whereof is hereby acknowledged, the said the Columbus Water Works Company, hath granted, bargained, sold, aliened, enfeoffed, released and confirmed, and by these presents doth grant, bargain, sell, alien, enfeoff, release and confirm unto the said Guarantee Trust and Safe Deposit Company, Trustee as aforesaid its successors and assigns,

The Water Works of the Columbus Water Works Company, situate in Muscogee County, State of Georgia, and in Lee and
263 Russell Counties, in the State of Alabama, Together with its lands, Machinery, Pipes, Outfit, Properties, Rights, Liberties, Privileges, Franchises, Tolls, Income, Rents, Issues and Profits now held or hereafter acquired by it.

To have and to hold, the same to the party of the Second part, its successors and assigns, forever in Trust, and upon the following conditions, to-wit; that the said party of the second part upon the failure of the said, the Columbus Water Works Company to pay any of the aforesaid Bonds or Coupons when the same shall become due and payable, and shall continue so for the space of three consecutive months, and upon request in writing by any *bona fide* owner and holder of said bond- and coupons to said party of the second part, the said party of the second part shall at its option foreclose this mortgage by suit at Law, or in equity, or shall be authorized, empowered and required to enter upon said real estate and take possession of the same and also all the other property of every character and description herein conveyed without process of law and shall sell the same or so much thereof as may be necessary, at public outcry to the highest bidder, upon such terms and at such times and places as the said Trustee, as aforesaid, may deem for the best interest of said Bond Holders after having given Thirty days' notice of the terms, time and place of sale in a Public Gazette in Columbus, Georgia, and Opelika, Alabama, and after entering on said lands and assuming possession of any and all of the aforesaid property;
264 the said Trustee, as aforesaid may continue and carry on the business of the said Water Works Company until the sale or final distribution of said property, and upon the sale of the real and personal property as herein described and provided for, the said Trustee as aforesaid, is hereby authorized and empowered to convey the same by proper and sufficient conveyance to the purchasers, their heirs, and assigns absolutely, and to put them in possession thereof.

So long as the party of the first part shall retain possession and control of said property and Franchises and of its Tolls, Income, rents, issues and profits, it shall pay all taxes, levies, charges, rates, and assessments which shall or may be legally imposed, assessed or levied upon the property and franchises hereby conveyed and will take care of and preserve the same, and at its own cost will do all acts necessary and proper to keep valid the lien hereby created and intended to be created, and will at any future time, and as often as may be necessary, execute all such other assurances, deeds, mortgages or other instruments of writing as may be proper to the better carrying out the true intent and meaning of these presents, and will

especially, and at its own cost do all things that may be reasonably required to make and keep valid the lien herein intended to be created upon after acquired property.

And it is expressly understood and agreed that on and after
265 the first day of November, A. D. 1898, the party of the first part may redeem all the said Bonds then outstanding, and any part thereof at par and accrued interest. Upon default of payment of the coupons on said bonds as herein before specified, and the seizure and sale of the property as set forth, thereupon the Principal of all of said Bonds shall be held and considered as due and the said party of the second part, after the payment of the expenses of said seizure and sale, and a reasonable commission or compe*m*sation to themselves for the execution of said Trust, shall appropriate the balance of the proceeds of said sale to the payment of the coupons then due and unpaid, and then the remainder if sufficient, shall be paid in extinguishment of said bonds, and if sufficient to be paid pro rata upon said bonds, and in no event giving preference to one over another of said bondholders, and if any balance shall remain after payment of this indebtedness, the same shall be paid to the said the Columbus Water Works Company.

In the event of the death, disability, removal or resignation of any Trustee, the party of the first part shall petition the Superior Court of Muscogee County, in the State of Georgia, for the appointment of a successor, bringing before said Court all the Bonds then outstanding Known to the party of the first part by actual or constructive service, and the Trustee or Trustees shall by said appointment be clothed with all the rights, powers and privileges, and subject to all the duties conferred by this mortgage upon the party of the second part.

266 It is hereby further covenanted and agreed that the trusts created by this instrument are accepted upon the express condition that the Trustee shall not incur any liability or responsibility whatever in consequence of permitting or suffering the party of the first part to retain or be in possession of the estates and premises hereby mortgaged or agreed, or intended so to be, and any part thereof, and to use and enjoy the same; nor shall the Trustee be or become liable or responsible for any destruction, deterioration, determination, loss, injury or damage which may be done or accrue to the estate hereby mortgaged or agreed or intended so to be by either the party of the first part or the agents or servants, or by any other person or persons whomsoever, nor shall the Trustee be in any way responsible for the consequences of any br*a*ech of the party of the first part of any of the covenants herein contained, nor liable to see to the application of the proceeds of any of the bonds secured hereby, nor of any act of the party of the first part, or its agents, or servants, nor for the failure to file this instrument as a Chattel/ Mortgage, nor shall the Trustee be held liable for any act, default or misconduct of any agent, or agents, or persons employed by it, unless chargeable with culpable negligence in the selection, or in the continuance of their employment, nor shall the Trustee be answerable except for its own willful default, or gross negligence, and in case the Trustee

shall enter into possession of said Mortgaged Premises and
267 operate the same as hereinbefore provided, it shall be indemnified out of the funds and property which shall come into its hands as aforesaid, for all claims and demands against it arising from negligence, careless conduct of its officers agents and employees. It is hereby further covenanted and agreed that the said Trustee shall not be under any obligation to take any action towards the execution of this Trust, which in its opinion will be liable to involve it in personal expense or liability, unless, and until some one or more, as the case may be, of said Bondholders or other person in their behalf, shall so often as reasonably required by the said Trustee give a good and sufficient indemnity against such expense or liability, anything herein contained to the contrary notwithstanding, but that it shall be the duty of and is hereby made obligatory upon said Trustee upon receiving proper indemnification as herein provided, to take appropriate proceedings at Law or in Equity, to enforce the rights of the Bondholders under these presnets upon requisition in writing as herein specified. And in all cases the Trustee shall be authorized to pay such reasonable compensation as it may deem proper to attorneys, servants, and agents whom it may reasonably employ in the management of the Trust, and the Trustee shall be entitled to and shall have just compensation for all services it may render in connection with the trusts, to be paid by the party of the first part out of the estate, and the Trustee may resign from the Trust by notice in writing to the party of the first part and to all known bond-
268 holders at least sixty days before such resignation shall take effect, or such shorter time as may be accepted as sufficient notice and upon the execution and delivery, if such shall be required of a Deed of Convayance and transfer to a successor in the Trust.

It is further understood that the recitals herein contained are made on behalf of the said The Columbus Water Works Company and the said Trustee assumes no responsibility as to the correctness of any statement therein contained. And the said the Columbus Water Works Company, unto the said Guarantee Trust and Safe Deposit Company, Trustee as aforesaid and its successors in trust, the herein bargained property, will warrant and defend against themselves and against the claims of their successors and assigns, and against the claims of all other persons whatsoever.

Provided Nevertheless, that if the said, the Columbus Water Works Company, its successors and assigns, shall and do well and truly pay, or cause to be paid, unto the said Owners and holders of said Bonds and Coupons, the amount due and payable thereon, on the days and times mentioned and appointed for the payment thereof, then this Indenture from thence and thenceforth as well as the right of property herein conveyed, shall cease and determine and be void to all intents and purposes.

In Witness Whereof, the said the Columbus Water Works Company, has hereunto caused its common or Corporate seal to be
269 affixed, dated the day and year first above written.

COLUMBUS WATER WORKS COMPANY.
By BENJAMIN F. ARCHER, *President.*
T. W. SYNNOTT, *Treas'r.*

[CORPORATE SEAL.]

Sealed and delivered in presence of us note made as the- severally become due interlined, Pg. 4 *to* line from bottom.
CHARLES E. CONERUT.
LEMUEL L. TAYLOR.

Received the day of the date of the above Indenture of the above named Guarantee Trust and Safe Deposit Company, the sum of Ten Dollars, being the full consideration money above mentioned.
T. W. SYNNOTT, *Treasurer.*

Witness present:
SAMUEL L. TAYLOR.

The Guarantee Trust and Safe Deposit Company do hereby accept the trust in said above mortgage created, and upon the terms and conditions therein specified.
GUARANTEE TRUST AND SAFE DEPOSIT COMPANY,
By E. C. STINGHT, *Vice President.* [SEAL.]

Attest:
M. HY. GILEDY, *Sec'ty.* [SEAL.]

STATE OF PENNSYLVANIA,
City and County of Philadelphia, ss:

Be it remembered that on the Twenty Seventh day of December, in the year of our Lord One Thousand Eight Hundred and
270 Eighty Eight, before me the subscriber, a Commissioner of Deeds for the State of Georgia, residing in the City of Philadelphia, personally appeared the above named Benjamin F. Archer, President, and Thomas W. Synnott, Treasurer of said Corporation, who have signed the foregoing Indenture of Mortgage and acknowledged that they signed, sealed and delivered the same as the Voluntary act and deed of the Columbus Water Works Company of Columbus, Muscogee County, Georgia, for the uses and purposes therein mentioned and that the seal affixed thereto is the Common or Corporate seal of the said Corporation; and there further personally appeared before me Charles E. Conerut, a subscribing witness to the foregoing Indenture or conveyance, known to me and being sworn stated that the Columbus Water Works Company, the grantors in the conveyance by Benjamin F. Archer then President, and Thomas W. Synnott, then Treasurer, voluntarily executed the same in his presence, and in the presence of the other subscribing witness on the day of the date hereof: That he attested the same in the presence of the said President and Treasurer, and of the other witnesses, and that such other witness subscribed his name as a witness in his presence.

Given under my hand and Official Seal this Twenty Seventh day of December, A. D. 1888.
[SEAL.]
SAMUEL L. TAYLOR,
Commissioner of Georgia.

271 STATE OF PENNSYLVANIA,
City and County of Philadelphia, ss:

Be it Remembered that on the Twenty Seventh day of December, in the year of our Lord, One Thousand Eight Hundred and Eighty Eight (1888) before me, the subscriber, a Commissioner of Deeds for the State of Alabama, residing in said City of Philadelphia, personally appeared the above named Benjamin F. Archer, President, and Thomas W. Synnott, Treasurer of said Corporation, being personally known to me and who have signed the foregoing Deed and acknowledged that they signed, sealed and delivered the same as the voluntary act and deed of the Columbus Water Works Company of Columbus, Muscogee County, Georgia, for the uses and purposes therein mentioned, and that the seal affixed thereto is the Common or Corporate Seal of the said Corporation.

And further personally appeared before me Charles E. Conerut a subscribing witness to the foregoing conveyance, personally known to me, and being sworn says, that the Columbus Water Works Company, the grantors in the conveyance, by Benjamin F. Archer their President, and Thomas W. Synnott, their Treasurer, Voluntarily executed the same in his presence and in the presence of the other subscribing witness on the day of the date hereof. That he attested the same in the presence of the said President and Treasurer and of the other witness, and that such other witness subscribed
272 his name as witness in his presence.

Given under my hand and Official Seal the Twenty Seventh day of December A. D. 1888.

[SEAL.]

SAMUEL L. TAYLOR,
Commissioner for Alabama.

Recorded January 4/89.
GEO. Y. POND, *Clk.*

Filed in Clerk's Office 26 Sept. 1903.

O. C. FULLER, *Clerk,*
By N. A. BROWN, *Deputy.*

STATE OF GEORGIA,
County of Muscogee:

CLERK'S OFFICE, SUPERIOR COURT.

I, Van Marcus, Clerk of the Superior Court of said County, said Court being a Court of record in and for said County, do hereby certify that the annexed and foregoing Twelve (12) Type-written pages contain a full true and correct transcript from the records of my said office of a certain Mortgage or Deed of Trust from The Columbus Water Works Company to The Guarantee Trust and Safe Deposit Company of Philadelphia, Penn. Recorded in Mortgage Book "E" Folios 188 to 195 inclusive.

Given under my Official signature with the seal of said Court affixed, this Sept. 22nd, 1903.

[SEAL.]

VAN MARCUS,
Clerk Superior Court Muscogee County, Georgia.

273 Complainant here introduced in evidence Mortgage given by the Columbus Water Works Company to the Mercantile Trust and Deposit Company of Baltimore, for $500,000.00 to cover issue of 500 bonds of $1000. each. said mortgage being recorded in Record of Mortgages, Vol. "G," folios 500 to 522, Jan'y 22, 1891, and which appears in this record on page 36, Volume 1.

Mr. GARRARD: We have decided not to introduce the extracts from the Minutes of the City Council of Columbus offered by the defendant. I would suggest that it all go in by agreement. If we have to offer it as our evidence, we don't offer it now.

The MASTER: If there is any part you want to offer you have a perfect right to do it.

Mr. GARRARD: We can do that later on in the case.

Mr. GARRARD: We will commence back from Sept. 5, 1870, and bring it on up to 1873 and then on up to '81. Our object in introducing this record is to show from the records the conditions that existed in Columbus prior to the building of this water works, the present system of water works.

The MASTER: What is that you hold in your hand?

Mr. GARRARD: These are the records of council, duly certified to by Mr. Moore. * * *

Mr. WIMBISH: We object to the admissibility of that evidence.

The MASTER: State in substance what is in the paper so that I can understand it.

274 (Mr. Garrard then here stated the substance of the paper he desired to offer in evidence, which is identified as "A" of the extracts from the Minutes of the City Council of Columbus, Ga.)

The MASTER: You are offering that paper?

Mr. GARRARD: I want to bring it on up to the time prior to the action of the city, just before the time this contract was made.

The MASTER: You are not through then with what you are offering?

Mr. GARRARD: No, sir; there is another one that brings it up to '79.

The MASTER: You are offer- all three of the papers together? You don't offer one without the three?

Mr. WIMBERLY: No, sir.

Mr. GARRARD: The first paper purports to be extracts of the minutes of council from September '70 to October 1873. I think your Honor could understand them better if you had them before you.

Mr. WIMBISH: We desire to interpose our objection to all this matter that precedes the contract. We desire to interpose that objection now. If he offers these we will object to them.

The MASTER: I can readily see that anything that is subsequent to the making the contract would be admissible. * * *

Mr. WIMBISH: We have got a right to object to them now. He first said he would offer all three of them and now he says he will offer them separately.

Mr. GARRARD: I want to read them for information.

275 Mr. WIMBERLY: You object to them if they come in separately?

Mr. WIMBISH: We object to them either way.

Mr. GARRARD: We offer them as information to the court.

Mr. WIMBISH: What do you offer?

Mr. GARRARD: I want to read this one and then we will offer all of them.

Mr. WIMBISH: He has no right to read it until he offers his paper.

The MASTER: He can either read it or state what is in it.

Mr. WIMBISH: He must offer it.

The MASTER: He can state what is in it.

Mr. WIMBISH: But he must offer the paper.

The MASTER: I can not rule on the testimony until I see what it is.

Mr. WIMBISH: He has no right to take up the time of this court reading any paper that he does not offer. He has no right to read all of his documentary evidence before he offers it.

The MASTER: He can state the substance of it so that I can see whether it is relevant.

Mr. WIMBISH: When do we object?

Mr. WIMBISH: When he offers it.

The MASTER: In this particular case he was reading it in connection with the other paper he is proposing to offer.

276 Mr. GARRARD: It is not read as evidence; but simply given as information to the master.

Mr. WIMBISH: We desire to object to that testimony. Object to anything being read as information to the court.

The MASTER: Take this ruling, Mr. Palmer: The complainant proposed to offer certain documentary evidence purporting to be certified copies of the records of council in three separate papers. Complainant stated that they would offer them separately. One of which papers marked "A" was read to the master; and before offering it counsel for complainant stated that he desired to read the other two papers for information, marked "B" and "C." Paper "B" was read and counsel for complainant was proceeding to read paper "C" when defendant objected to the paper being read before offered as evidence.

Mr. GARRARD: While I am going to offer them all, I will offer these first two.

The MASTER: What is your objection to these two papers, which I will designate as "A" and "B"? (Addressing counsel for the defendant).

Mr. WIMBISH: Now then we object to that testimony on the ground that it does not illustrate and can not possibly illustrate any issue in his case. Now what are the issues? There are two and only two main issues. Of course there are collateral or incidental issues; but there are but two issues in this case, one of fact and one of law. The issue of fact is whether the Columbus Water Company

277 has complied with its contract. The issue of law, the second issue is: whether under the facts, as we shall show them to

have existed, the City of Columbus had the right to withdraw and take steps to erect its own system of water works. It is utterly immaterial what preceded the execution of this contract. I don't suppose any city ever erected water works or contracted for their erection without some previous discussion. That is done in every case, as far as that is concerned. There is no issue as to that. There is no question as to what preceded the contract, neither is there any question as to the contract. Here is a contract that was made by both parties and both parties ratified it. There is no question about the contract at all. The question is: have they complied with their contract? We say what may have preceded it is utterly and absolutely immaterial. It can illustrate no possible issue in this case. It can give the court no possible information. It can throw no possible light on any phase of the question presented to your Honor. You take this matter that he has offered here: What does he offer it for? To show conditions. What conditions? That the city wanted water works. Suppose they did? Suppose they made various propositions which had not been carried into effect? Suppose they appointed a committee of citizens? How does that illustrate this cause? Your Honor is not construing the contract. There is no issue as to the contract. I don't think we differ as to the construction of
278 the contract. If we do, no such matters as these can throw any light on it. The sole question is: Have they complied with their contract? Whatever preceded it we contend is utterly immaterial and is a burden to the record and tends to confuse the issues in the case.

The MASTER: Gentlemen, I don't see now, under the allegations in the bill, and in the absence of anything in the answer to connect it, that this record as contained in this paper marked "A" is exactly pertinent. I am inclined not to admit that paper "A" just at this time. I will say, if during the course of the case, you show that it is pertinent, I will admit it.

Mr. WIMBERLY: Then your Honor for the present admits "B" and excludes "A"?

The MASTER: Yes, sir. There is no objection to this paper "B." I don't know whether counsel on the other side wish to say anything further or wish to still object to it?

Mr. WIMBISH: Yes, sir; we have noted our objection.

The MASTER: I will let in this paper "B." "C," do you offer that now?

Mr. GARRARD: Yes, sir.

The MASTER: Any objection to that?

Mr. WIMBISH: No, sir.

The MASTER: I can see none to that.

(Counsel for complainant then read and offered in evidence the following marked "B" and "C" respectively:

279 *Extracts of Minutes of City Council of Columbus, Ga.*

"B."

COUNCIL CHAMBER, *Dec.* 30, 1878.

Adjourned Meeting.

"A communication from Mr. A. Wilkins, of Charleston, S. C., to His Honor, the Mayor, in regard to building water works was on motion of Alderman Scheussler, referred to the Mayor and Alderman Manley and Brooks for answer."

COUNCIL CHAMBER, *Feb.* 3, 1881.

Regular Meeting.

"By Ald. MANLEY: Whereas, a supply of good pure water is of the utmost importance to every community and calculated to add largely to the health and comfort of every city, and at the same time reduce the ordinary insurance risk on property, and in every way contribute to the welfare of a community, Be it Resolved, that the City Council of Columbus will hail with pleasure the organization of any responsible and competent company for the purpose of supplying the city with good, pure water, and will do all she can to make the undertaking a success, and will grant the right of way to all and any of the streets for the purpose of laying pipes and such other fixtures as may be necessary in constructing said water ways without any obstruction to the streets, and will give all the patronage she can consistently, to the enterprise.

Resolved, that we are satisfied that our citizens are anxious to secure this great boon, and will give to a properly organized water works company a hearty and material support both in sub-
280 scription for stock and a liberal use of the water.

Mr. A. Wilkins, of Charleston S. C. being present was requested to give some information as to cost of water works etc. He said that he thought that if the city would agree to take fifty hydrants for fire purposes, at eighty dollars each per year, he could guarantee water works with five miles of mains within a year. The resolutions of Mr. Manley were then adopted.

COUNCIL CHAMBER, *March* 2, 1881.

Regular meeting.

The following proposition for building water works was read.

(Here follows proposition from A. Wilkins, in behalf of himself and others who may hereafter become incorporated with him in a water company) proposing to construct an effective system of water works to supply the city and citizens of Columbus with water for domestic, manufacturing and sanitary purposes, as well as for the better protection of the city from the ravages of fire.

* * * * * * *

By Ald. DILLINGHAM: "Resolved that Messrs. John Hill and W. Riley Brown, citizens of Columbus, be requested to officiate as a committee of conference in concert with his Honor, the Mayor, and the chairman of the committee on contracts, to determine the policy of

this body, in regard to the communication from Mr. A. Wilkins, of Charleston S. C. respecting the erection and operation of
281 water works.

Ald. Brooks offered as a substitute the following.

"Whereas, from the rapid growth of our City in population and wealth, it is very evident that the time has arrived when it is all important that an ample supply of good pure water should be obtained not only for the private consumption of the citizens but for the better protection of property also, and as this desirable object can only be accomplished by the erection of water works, and as we fully believe that a very large majority of our citizens are not only in favor of them, but are hopeful that at an early period, a system will be adopted, that will fully meet their wants and necessities; therefore Be it Resolved

That we are favorably impressed with the proposition made to the City Council by Mr. A. Wilkins of Charleston, S. C. to erect water works in our city and that the same be accepted by Council.

Resolved, that a committee of three be appointed by His Honor, the Mayor, (the Mayor to constitute one of the committee whose duty it shall be to enter without delay into negotiations with Mr. Wilkins and make such a contract with him upon the basis of his said proposition to council, as will effectually secure to this city an ample and abundant supply of good pure water, and at as reasonable rates for rental as the average cities of Georgia are charged.

And as the said Wilkins, in his proposition to council, was undecided as to what plan or system he would adopt in the erec-
282 tion of said works, we would respectfully recommend that the distribution of water *water* be made on the gravitation plan being in our judgment preferable to any other.

Resolved, that said contract, when drawn up be submitted to council for approval before its final ratification.

Ald. Scheussler moved to amend by adding to the council committee W. Riley Brown and John Hill. Which amendment was accepted by Alderman Brooks, and the substitute as amended was adopted.

His Honor, the Mayor appointed Aldermen Manley and Everett, with himself, as that committee.

COUNCIL CHAMBER, *Sept.* 20, 1881.

Called Meeting.

His Honor, the Mayor, stated that it being the last of the extension of time to Mr. A. Wilkins for commencing work in the building of water works he had deemed it proper to call the board together to take such action in the premises as might be deemed proper. He had to day received a communication from Mr. Wilkins, dated 17th instant, saying that "owing to the fact that my party has recently taken some larger a*m*d more profitable contracts and the brevity of time given in the extension, I find I must forego the advantages which I had anticipated in the water works contract" etc.

Besides the above mentioned letter from Mr. A. Wilkins, several communications to the Mayor from A. H. McNeil, of Burling-
283 ton, N. J. and Thom. R. White of Philadelphia, relative to building water works were read.

By Ald. SHINGULEUR: "Whereas, it having been satisfactorily shown to Council that the contract entered into with Mr. Wilkins of Charleston, S. C. to build water works in the City of Columbus, has proved a failure, and that the said Wilkins has utterly failed to commence said work within the time specified in said contract, therefore, be it

Resolved, that the said contract between Council and the said A. Wilkins for the construction of said works, be and the same is hereby revoked and annulled.

Resolved, further, that a committee of five be appointed by the mayor, three of said committee to be members of council, his Honor, the Mayor to constitute one of the committee, and two from the citizens at large, to at once enter into correspondence with some responsible party to build said works in accordance with the agreement heretofore adopted by Council said committee being authorized to contract with said party without any further delay, provided said parties can give a satisfactory guarantee of their ability to complete said works in good faith.

Adopted, and his Honor, the Mayor, appointed the following committee; Ald. Shinguleur, Murdock, Messrs. W. Riley Brown and John Hill.

STATE OF GEORGIA,
County of Muscogee, City of Columbus:

I hereby certify that the foregoing five pages of type written
284 matter contain true extracts from the minutes of the City Council of Columbus, of the dates mentioned.

This the 19th day of September, 1903.

[SEAL.] M. M. MOORE,
Clerk of City Council of Columbus.

Filed in Clerk's office 26 Sept. 1903.

O. C. FULLER, *Clerk*,
By N. A. BROWN, *Deputy*.

285 APRIL 5, 1882.

* * * * * * *

"The following report of committee on Water Works, assignment by Thos. R. White, with preamble and resolutions were read.

"To the Hon. Mayor and Council:

Your committee on Water Works beg leave to report, that the Columbus Water Works Company has been fully organized and the stock subscribed by the responsible parties.

Mr. White has transferred his contract to the Company, and your Honorable body is requested to ratify the same. The Company also desire that privilege be given them to bring their pipes across the upper bridge, and to enter the City thereby. Believing that this can be done not only without injury to the bridge, but according to the plan suggested the bridge will be made actually stronger, we recommend permission be granted. The streets through which the

pipes are to run have been designated and a plan thereof is herewith submitted for the information of the board.

The Company also ask for a reasonable extension of the time for the completion of the contract, which we recommend be granted. Your committee feel assured that this company will enter at once upon the work and will push it forward to an early completion. All of which is respectfully submitted.

BRANNON,
CURTIS,
Com. from Council.

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JNO. HILL,
W. R. BROWN,
Com. from Citizens.

"Assignment."

"GEORGIA,
Muscogee County:

For value received, I Thos. R. White, hereby transfer, assign and convey to "The Columbus Water Works Company" all its rights, titles and interest that I have in, to and by virtue of a contract made and entered into on the — day of October, 1881 between myself and the Mayor and Council of the City of Columbus, for the construction and operation of an effective system of water works for the supply of the City of Columbus with water for the various uses required, etc." the said Columbus Water Works Company assuming all obligations to the said Mayor and Council under said contract and to have, possess and enjoy all the rights, privileges and emoluments arising therefrom.

Witness my hand and seal this third day of April, A. D., 1882.

THOMAS R. WHITE.

Signed, sealed and delivered in the presence of:

CLIFF B. GRIMES,
Notary Public. [SEAL.]

"Whereas the Columbus Water Works Co. has been duly organized and Thos. R. White with whom the Mayor and Council on the — day of Oct. 1881, entered into a contract for the construction and operation of an effective system of water works for the supply of the City of Columbus with water for the various uses required," etc., has transferred and assigned his rights, title and interest under *siad* contract to the Columbus Water Works Company, therefore Be it Resolved by the Mayor and Council of the City of Columbus that they hereby ratify and assent to the said transfer and assignment and recognize the said Columbus Water Works Co. as assuming the obligations, and entitled to all the rights, privileges and emoluments arising under said contract.

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Resolved further, that the Mayor and Council hereby grant to the said Columbus Water Works Company an extension of the time, to-

wit, until the (Nov. 1)* day of 1882, for the completion of their said contract, as provided by the terms thereof.

Resolved further, that permission is hereby granted the said Columbus Water Works Company to bring their main water works pipes across the Chattahoochee River on the inside of the upper City bridge, and to keep said pipe upon said bridge, provided the same shall be done in such manner and upon such terms as the committee on water works shall approve of—not more than 15 inches in width of said bridge shall be used for such purposes."

On motion of Ald. Brannon the blank above was filled with "1st November" and the resolution then adopted. (The plan for laying pipes and plan for crossing the bridge were retained by the committee)."

* * * * * * *

COUNCIL CHAMBER, *Nov.* 1, 1882.

* * * * * * *

"Ald. Brannon stated that the water works would be tested
288 tomorrow afternoon at four o'clock, to which the Council and all citizens were invited, and suggested that a meeting of Council be held on Monday next to take such action as might be necessary in relation to the same." * * *

COUNCIL CHAMBER, *Nov.* 6, 1882.

* * * * * * *

COLUMBUS, GA., *Oct.* 31, 1882.

To the Hon. Mayor & Council of the City of Columbus.

GENTLEMEN: In behalf of Columbus Water Works Company the undersigned begs leave to inform your Honorable body that in accordance with the contract made between yourselves and Mr. Thos. R. White, and subsequently transferred to our Company, we have completed the system of water supply for your city, and Reservoir is amply provided, and the mains are now full, and the water ready for distribution and use, under the terms of said contract. We feel that we are justified in saying that the work has been done by our company in the most complete and substantial manner, in which neither time, labor nor expense has been spared, and in adding our assurance that the water supplied will be wholesome, abundant and lasting, and we trust that your Honorable Body, as well as the citizens of Columbus generally, will find everything connected with our work as satisfactory as we have endeavored to make it so. The magnitude and substantial character of the work, which has
289 greatly increased the expense of the undertaking to the Company, will we trust fully compensate for the delay in its completion.

The Company desires that your Honorable Body may take some official action signifying your acceptance of the work, and the adoption of such suitable measures as may be requisite for the more

[* In pencil in copy.]

fully carrying into effect the provisions of said contract. All of which is respectfully submitted.

B. F. ARCHER,
President Columbus Water Works Company."

It being stated that the filters of the Reservoir differed from the one prescribed in the contract, Mr. Thos. R. White was sent for, who explained that the one built was an improvement over the one described in the contract for the reason that it could be easily taken out and cleaned, which explanation was satisfactory.

The committee on water works offered the following, which was adopted:

"Resolved, that the Mayor and Council of the City of Columbus, being satisfied that the water works for the supply of water for the city and citizens of Columbus, has been completed by the Columbus Water Works Company in accordance with the contract made between the said Mayor and Council and Thos. R. White on the 7th day of October, 1881, and subsequently on the 3rd day of April, 1882, transferred to the said Columbus Water Works Com-
290 pany, and the said Mayor and Council hereby accept the same, and the committee are hereby authorized to locate drinking fountains and adopt such other measures that may be necessary for the full execution of said contract."

Ald. W. H. Brannon, N. N. Curtis, Mr. Jno. Hill, Mr. W. R. Brown, Com."

* * * * * * *

COUNCIL CHAMBER, *July* 7, 1883.

* * * * * * *

"To the Hon. Mayor and Council:

Your Finance Committee would report that the contract with the water Works Company provides that fifty double hydrants shall be placed on the original five miles of street distribution, making in all one hundred hose connections. It further provides that the rent for said hydrants shall be $80 each; equal to four thousand dollars per year payable quarterly; and on future extensions the rate shall be $75 per hydrant. The fifty double hydrants as per contract have been located, reported by your water committee and received by the City. Now the Water Works Company continue the extensions of their water main and ask your water committee to locate other hydants.

The financial basis for the year 1883 was made upon the
291 rental of $4000 for water supply, and your committee deem it their duty, and advisable to call your attention to this matter, and have you to say whether the number of hydrants shall be increased or not. We further report that there are now some half dozen or more located or in process of location.

Respectfully,

BRANNON, CURTIS, JORDAN,
Committee."

On motion of Alderman Kyle, it was resolved that Council would accept not exceeding ten hydrants this year, in addition to the fifty originally contracted for—the same to be located by the committee on water works."

* * * * * * *

COUNCIL CHAMBER, *July* 4, 1883.

* * * * * * *

"The following report was received.

"Your committee on water works report that, in company with Mr. Yocum, Superintendent, they visited the extension on Oglethorpe and Mercer Streets, and located six hydrants, four on Oglethorpe and two on Mercer. Mr. Yocum was informed that Council had resolved that it would only take ten hydrants this year in addition to the number in original contract, and that if these six were put in as per location, the Water Works Company would not receive any pay for same until Council saw proper to do so. The hydrants have been placed and it is now with the Council as to their use and pay.

BRANNON,
EVERETT,
Committee."

292 Ald. Curtis moved that, in case of the use of the hydrants the committee be authorized to confer with the Water Works Company and agree upon the price to be paid for said use. Agreed to." * * *

STATE OF GEORGIA,
County of Muscogee, City of Columbus:

I hereby certify that the foregoing five typewritten pages contain true and correct extracts from the Minutes of the City Council of Columbus, of the dates named.

This the 19th day of September, 1903.

[SEAL.] M. M. MOORE,
Clerk of City Council of Columbus.

Filed in Clerk's office 19 Sept., 1903.

O. C. FULLER, *Clerk,*
By N. A. BROWN, *Deputy.*

293 Mr. GARRARD: We tender this answer to the notice to produce.

(Said answer was objected to on the ground that the same was not a full and complete answer to the notice to produce; and further that the notice does not show why the books called for did not go into their custody and control; and the notice does not say why it is not in their control and does not show what efforts have been made to get the books; and further that it is a response by the president of the company; that there being a secretary of the company he should have charge of the books called for; and that the affidavit of the

One Hundred of the denomination of One Thousand Dollars each, all being of like tenor and date, secured by first Mortgage upon the Water Works of the said, the Columbus Water Works Company in the City of Columbus, County of Muscogee and State of Georgia; and in the County of Lee, and County of Russell, in the State
261 of Alabama: Together with its lands, machinery, pipes, outfit, properties, rights, liberties, privileges and franchises, and all the tolls, income, rents, issues and profits now held or hereafter to be acquired by it to The Guarantee Trust and Safe Deposit Company of Philadelphia, Pennsylvania, Trustee, dated the First day of November, A. D. 1888, and duly acknowledged and recorded according to law in the proper Probate Office in the County of Muscogee and State of Georgia, and in the Counties of Lee and Russell, in the State of Alabama. This Bond is redeemable at the Option of the Company at par and accrued interest on and after the first of November, A. D. 1898.

This Bond shall not become obligatory until Authenticated by the signature of the proper Officers of the said Guarantee Trust and Safe Deposit Company Trustee, to the Certificate hereon endorsed.

In Witness Whereof, the said the Columbus Water Works Company has caused this instrument to be sealed with its corporate seal, attested by the signatures of its President and Secretary and the coupons hereto attached to be signed by its Treasurer, this First day of November, A. D. 1888.

—— ——, *President.*

Attest:

—— ——, *Secretary.*

(*Certificate Endorsed on Bond.*)

The Guarantee Trust and Safe Deposit Company hereby certifies that the within Bond is one of a series of Two Hundred Bonds
262 100 of Five Hundred Dollars each, and One Hundred of One Thousand Dollars each, secured by the Mortgage thereon mentioned.

GUARANTEE TRUST AND SAFE DEPOSIT COMPANY, *Trustee,*

By —— ——, *President.*

(*Coupon.*)

The Columbus Water Works Company, Will pay to bearer on the — day of —— A. D. ——, ($—) — Dollars, on presentation of this Coupon at the Office of the Guarantee Trust and Safe Deposit Company, in the City of Philadelphia, for semi-annual interest on this Mortgage Bond, No. —.

—— ——, *Treasurer.*

Now, This Indenture Witnesseth, that for the purpose of securing the prompt and ultimate payment of the aforesaid bonds and coupons and for and in consideration of the premises as well as for the sum

of Ten Dollars lawful money, to the said, the Columbus Water Works Company paid by the said Guarantee Trust and Safe Deposit Company, Trustee, as aforesaid, the receipt whereof is hereby acknowledged, the said the Columbus Water Works Company, hath granted, bargained, sold, aliened, enfeoffed, released and confirmed, and by these presents doth grant, bargain, sell, alien, enfeoff, release and confirm unto the said Guarantee Trust and Safe Deposit Company, Trustee as aforesaid its successors and assigns,

The Water Works of the Columbus Water Works Company, situate in Muscogee County, State of Georgia, and in Lee and
263 Russell Counties, in the State of Alabama, Together with its lands, Machinery, Pipes, Outfit, Properties, Rights, Liberties, Privileges, Franchises, Tolls, Income, Rents, Issues and Profits now held or hereafter acquired by it.

To have and to hold, the same to the party of the Second part, its successors and assigns, forever in Trust, and upon the following conditions, to-wit; that the said party of the second part upon the failure of the said, the Columbus Water Works Company to pay any of the aforesaid Bonds or Coupons when the same shall become due and payable, and shall continue so for the space of three consecutive months, and upon request in writing by any *bona fide* owner and holder of said bond- and coupons to said party of the second part, the said party of the second part shall at its option foreclose this mortgage by suit at Law, or in equity, or shall be authorized, empowered and required to enter upon said real estate and take possession of the same and also all the other property of every character and description herein conveyed without process of law and shall sell the same or so much thereof as may be necessary, at public outcry to the highest bidder, upon such terms and at such times and places as the said Trustee, as aforesaid, may deem for the best interest of said Bond Holders after having given Thirty days' notice of the terms, time and place of sale in a Public Gazette in Columbus, Georgia, and Opelika, Alabama, and after entering on said lands and assuming possession of any and all of the aforesaid property;
264 the said Trustee, as aforesaid may continue and carry on the business of the said Water Works Company until the sale or final distribution of said property, and upon the sale of the real and personal property as herein described and provided for, the said Trustee as aforesaid, is hereby authorized and empowered to convey the same by proper and sufficient conveyance to the purchasers, their heirs, and assigns absolutely, and to put them in possession thereof.

So long as the party of the first part shall retain possession and control of said property and Franchises and of its Tolls, Income, rents, issues and profits, it shall pay all taxes, levies, charges, rates, and assessments which shall or may be legally imposed, assessed or levied upon the property and franchises hereby conveyed and will take care of and preserve the same, and at its own cost will do all acts necessary and proper to keep valid the lien hereby created and intended to be created, and will at any future time, and as often as may be necessary, execute all such other assurances, deeds, mortgages or other instruments of writing as may be proper to the better carrying out the true intent and meaning of these presents, and will

especially, and at its own cost do all things that may be reasonably required to make and keep valid the lien herein intended to be created upon after acquired property.

And it is expressly understood and agreed that on and after
265 the first day of November, A. D. 1898, the party of the first part may redeem all the said Bonds then outstanding, and any part thereof at par and accrued interest. Upon default of payment of the coupons on said bonds as herein before specified, and the seizure and sale of the property as set forth, thereupon the Principal of all of said Bonds shall be held and considered as due and the said party of the second part, after the payment of the expenses of said seizure and sale, and a reasonable commission or compe*m*sation to themselves for the execution of said Trust, shall appropriate the balance of the proceeds of said sale to the payment of the coupons then due and unpaid, and then the remainder if sufficient, shall be paid in extinguishment of said bonds, and if sufficient to be paid pro rata upon said bonds, and in no event giving preference to one over another of said bondholders, and if any balance shall remain after payment of this indebtedness, the same shall be paid to the said the Columbus Water Works Company.

In the event of the death, disability, removal or resignation of any Trustee, the party of the first part shall petition the Superior Court of Muscogee County, in the State of Georgia, for the appointment of a successor, bringing before said Court all the Bonds then outstanding Known to the party of the first part by actual or constructive service, and the Trustee or Trustees shall by said appointment be clothed with all the rights, powers and privileges, and subject to all the duties conferred by this mortgage upon the party of the second part.

266 It is hereby further covenanted and agreed that the trusts created by this instrument are accepted upon the express condition that the Trustee shall not incur any liability or responsibility whatever in consequence of permitting or suffering the party of the first part to retain or be in possession of the estates and premises hereby mortgaged or agreed, or intended so to be, and any part thereof, and to use and enjoy the same; nor shall the Trustee be or become liable or responsible for any destruction, deterioration, determination, loss, injury or damage which may be done or accrue to the estate hereby mortgaged or agreed or intended so to be by either the party of the first part or the agents or servants, or by any other person or persons whomsoever, nor shall the Trustee be in any way responsible for the consequences of any br*a*ech of the party of the first part of any of the covenants herein contained, nor liable to see to the application of the proceeds of any of the bonds secured hereby, nor of any act of the party of the first part, or its agents, or servants, nor for the failure to file this instrument as a Chattel Mortgage, nor shall the Trustee be held liable for any act, default or misconduct of any agent, or agents, or persons employed by it, unless chargeable with culpable negligence in the selection, or in the continuance of their employment, nor shall the Trustee be answerable except for its own willful default, or gross negligence, and in case the Trustee

shall enter into possession of said Mortgaged Premises and
267 operate the same as hereinbefore provided, it shall be indemnified out of the funds and property which shall come into its hands as aforesaid, for all claims and demands against it arising from negligence, careless conduct of its officers agents and employees. It is hereby further covenanted and agreed that the said Trustee shall not be under any obligation to take any action towards the execution of this Trust, which in its opinion will be liable to involve it in personal expense or liability, unless, and until some one or more, as the case may be, of said Bondholders or other person in their behalf, shall so often as reasonably required by the said Trustee give a good and sufficient indemnity against such expense or liability, anything herein contained to the contrary notwithstanding, but that it shall be the duty of and is hereby made obligatory upon said Trustee upon receiving proper indemnification as herein provided, to take appropriate proceedings at Law or in Equity, to enforce the rights of the Bondholders under these pres*n*ts upon requisition in writing as herein specified. And in all cases the Trustee shall be authorized to pay such reasonable compensation as it may deem proper to attorneys, servants, and agents whom it may reasonably employ in the management of the Trust, and the Trustee shall be entitled to and shall have just compensation for all services it may render in connection with the trusts, to be paid by the party of the first part out of the estate, and the Trustee may resign from the Trust by notice in
writing to the party of the first part and to all known bond-
268 holders at least sixty days before such resignation shall take effect, or such shorter time as may be accepted as sufficient notice and upon the execution and delivery, if such shall be required of a Deed of Con*v*ayance and transfer to a successor in the Trust.

It is further understood that the recitals herein contained are made on behalf of the said The Columbus Water Works Company and the said Trustee assumes no responsibility as to the correctness of any statement therein contained. And the said the Columbus Water Works Company, unto the said Guarantee Trust and Safe Deposit Company, Trustee as aforesaid and its successors in trust, the herein bargained property, will warrant and defend against themselves and against the claims of their successors and assigns, and against the claims of all other persons whatsoever.

Provided Nevertheless, that if the said, the Columbus Water Works Company, its successors and assigns, shall and do well and truly pay, or cause to be paid, unto the said Owners and holders of said Bonds and Coupons, the amount due and payable thereon, on the days and times mentioned and appointed for the payment thereof, then this Indenture from thence and thenceforth as well as the right of property herein conveyed, shall cease and determine and be void to all intents and purposes.

In Witness Whereof, the said the Columbus Water Works Company, has hereunto caused its common or Corporate seal to be
269 affixed, dated the day and year first above written.

COLUMBUS WATER WORKS COMPANY,
By BENJAMIN F. ARCHER, *President.*
T. W. SYNNOTT, *Treas'r.*

[CORPORATE SEAL.]

Sealed and delivered in presence of us note made as the- severally become due interlined, Pg. 4 *to* line from bottom.

CHARLES E. CONERUT.
LEMUEL L. TAYLOR.

Received the day of the date of the above Indenture of the above named Guarantee Trust and Safe Deposit Company, the sum of Ten Dollars, being the full consideration money above mentioned.

T. W. SYNNOTT, *Treasurer.*

Witness present:
SAMUEL L. TAYLOR.

The Guarantee Trust and Safe Deposit Company do hereby accept the trust in said above mortgage created, and upon the terms and conditions therein specified.

GUARANTEE TRUST AND SAFE DEPOSIT COMPANY.
By E. C. STINGHT, *Vice President.* [SEAL.]

Attest:
M. HY. GILEDY, *Sec'ty.* [SEAL.]

STATE OF PENNSYLVANIA,
City and County of Philadelphia, ss:

Be it remembered that on the Twenty Seventh day of December, in the year of our Lord One Thousand Eight Hundred and
270 Eighty Eight, before me the subscriber, a Commissioner of Deeds for the State of Georgia, residing in the City of Philadelphia, personally appeared the above named Benjamin F. Archer, President, and Thomas W. Synnott, Treasurer of said Corporation, who have signed the foregoing Indenture of Mortgage and acknowledged that they signed, sealed and delivered the same as the Voluntary act and deed of the Columbus Water Works Company of Columbus, Muscogee County, Georgia, for the uses and purposes therein mentioned and that the seal affixed thereto is the Common or Corporate seal of the said Corporation; and there further personally appeared before me Charles E. Conerut, a subscribing witness to the foregoing Indenture or conveyance, known to me and being sworn stated that the Columbus Water Works Company, the grantors in the conveyance by Benjamin F. Archer then President, and Thomas W. Synnott, then Treasurer, voluntarily executed the same in his presence, and in the presence of the other subscribing witness on the day of the date hereof: That he attested the same in the presence of the said President and Treasurer, and of the other witnesses, and that such other witness subscribed his name as a witness in his presence.

Given under my hand and Official Seal this Twenty Seventh day of December, A. D. 1888.

[SEAL.]

SAMUEL L. TAYLOR.
Commissioner of Georgia.

271 STATE OF PENNSYLVANIA,
City and County of Philadelphia, ss:

Be it Remembered that on the Twenty Seventh day of December, in the year of our Lord, One Thousand Eight Hundred and Eighty Eight (1888) before me, the subscriber, a Commissioner of Deeds for the State of Alabama, residing in said City of Philadelphia, personally appeared the above named Benjamin F. Archer, President, and Thomas W. Synnott, Treasurer of said Corporation, being personally known to me and who have signed the foregoing Deed and acknowledged that they signed, sealed and delivered the same as the voluntary act and deed of the Columbus Water Works Company of Columbus, Muscogee County, Georgia, for the uses and purposes therein mentioned, and that the seal affixed thereto is the Common or Corporate Seal of the said Corporation.

And further personally appeared before me Charles E. Conerut a subscribing witness to the foregoing conveyance, personally known to me, and being sworn says, that the Columbus Water Works Company, the grantors in the conveyance, by Benjamin F. Archer their President, and Thomas W. Synnott, their Treasurer, Voluntarily executed the same in his presence and in the presence of the other subscribing witness on the day of the date hereof. That he attested the same in the presence of the said President and Treasurer and of the other witness, and that such other witness subscribed
272 his name as witness in his presence.

Given under my hand and Official Seal the Twenty Seventh day of December A. D. 1888.

[SEAL.] SAMUEL L. TAYLOR,
Commissioner for Alabama.

Recorded January 4/89.
GEO. Y. POND, *Clk.*

Filed in Clerk's Office 26 Sept. 1903.
O. C. FULLER, *Clerk,*
By N. A. BROWN, *Deputy.*

STATE OF GEORGIA,
County of Muscogee:

CLERK'S OFFICE, SUPERIOR COURT.

I, Van Marcus, Clerk of the Superior Court of said County, said Court being a Court of record in and for said County, do hereby certify that the annexed and foregoing Twelve (12) Type-written pages contain a full true and correct transcript from the records of my said office of a certain Mortgage or Deed of Trust from The Columbus Water Works Company to The Guarantee Trust and Safe Deposit Company of Philadelphia, Penn. Recorded in Mortgage Book "E" Folios 188 to 195 inclusive.

Given under my Official signature with the seal of said Court affixed, this Sept. 22nd, 1903.

[SEAL.] VAN MARCUS,
Clerk Superior Court Muscogee County, Georgia.

273 Complainant here introduced in evidence Mortgage given by the Columbus Water Works Company to the Mercantile Trust and Deposit Company of Baltimore, for $500,000.00 to cover issue of 500 bonds of $1000. each, said mortgage being recorded in Record of Mortgages, Vol. "G," folios 500 to 522, Jan'y 22, 1891, and which appears in this record on page 36, Volume 1.

Mr. GARRARD: We have decided not to introduce the extracts from the Minutes of the City Council of Columbus offered by the defendant. I would suggest that it all go in by agreement. If we have to offer it as our evidence, we don't offer it now.

The MASTER: If there is any part you want to offer you have a perfect right to do it.

Mr. GARRARD: We can do that later on in the case.

Mr. GARRARD: We will commence back from Sept. 5, 1870, and bring it on up to 1873 and then on up to '81. Our object in introducing this record is to show from the records the conditions that existed in Columbus prior to the building of this water works, the present system of water works.

The MASTER: What is that you hold in your hand?

Mr. GARRARD: These are the records of council, duly certified to by Mr. Moore. * * *

Mr. WIMBISH: We object to the admissibility of that evidence.

The MASTER: State in substance what is in the paper so that I can understand it.

274 (Mr. Garrard then here stated the substance of the paper he desired to offer in evidence, which is identified as "A" of the extracts from the Minutes of the City Council of Columbus, Ga.)

The MASTER: You are offering that paper?

Mr. GARRARD: I want to bring it on up to the time prior to the action of the city, just before the time this contract was made.

The MASTER: You are not through then with what you are offering?

Mr. GARRARD: No, sir; there is another one that brings it up to '79.

The MASTER: You are offer- all three of the papers together? You don't offer one without the three?

Mr. WIMBERLY: No, sir.

Mr. GARRARD: The first paper purports to be extracts of the minutes of council from September '70 to October 1873. I think your Honor could understand them better if you had them before you.

Mr. WIMBISH: We desire to interpose our objection to all this matter that precedes the contract. We desire to interpose that objection now. If he offers these we will object to them.

The MASTER: I can readily see that anything that is subsequent to the making the contract would be admissible. * * *

Mr. WIMBISH: We have got a right to object to them now. He first said he would offer all three of them and now he says he will offer them separately.

Mr. GARRARD: I want to read them for information.

275 Mr. WIMBERLY: You object to them if they come in separately?

Mr. WIMBISH: We object to them either way.

Mr. GARRARD: We offer them as information to the court.

Mr. WIMBISH: What do you offer?

Mr. GARRARD: I want to read this one and then we will offer all of them.

Mr. WIMBISH: He has no right to read it until he offers his paper.

The MASTER: He can either read it or state what is in it.

Mr. WIMBISH: He must offer it.

The MASTER: He can state what is in it.

Mr. WIMBISH: But he must offer the paper.

The MASTER: I can not rule on the testimony until I see what it is.

Mr. WIMBISH: He has no right to take up the time of this court reading any paper that he does not offer. He has no right to read all of his documentary evidence before he offers it.

The MASTER: He can state the substance of it so that I can see whether it is relevant.

Mr. WIMBISH: When do we object?

Mr. WIMBISH: When he offers it.

The MASTER: In this particular case he was reading it in connection with the other paper he is proposing to offer.

276 Mr. GARRARD: It is not read as evidence; but simply given as information to the master.

Mr. WIMBISH: We desire to object to that testimony. Object to anything being read as information to the court.

The MASTER: Take this ruling, Mr. Palmer: The complainant proposed to offer certain documentary evidence purporting to be certified copies of the records of council in three separate papers. Complainant stated that they would offer them separately. One of which papers marked "A" was read to the master; and before offering it counsel for complainant stated that he desired to read the other two papers for information, marked "B" and "C." Paper "B" was read and counsel for complainant was proceeding to read paper "C" when defendant objected to the paper being read before offered as evidence.

Mr. GARRARD: While I am going to offer them all, I will offer these first two.

The MASTER: What is your objection to these two papers, which I will designate as "A" and "B"? (Addressing counsel for the defendant).

Mr. WIMBISH: Now then we object to that testimony on the ground that it does not illustrate and can not possibly illustrate any issue in his case. Now what are the issues? There are two and only two main issues. Of course there are collateral or incidental issues; but there are but two issues in this case, one of fact and one of law.

277 The issue of fact is whether the Columbus Water Company has complied with its contract. The issue of law, the second issue is: whether under the facts, as we shall show them to

have existed, the City of Columbus had the right to withdraw and take steps to erect its own system of water works. It is utterly immaterial what preceded the execution of this contract. I don't suppose any city ever erected water works or contracted for their erection without some previous discussion. That is done in every case, as far as that is concerned. There is no issue as to that. There is no question as to what preceded the contract, neither is there any question as to the contract. Here is a contract that was made by both parties and both parties ratified it. There is no question about the contract at all. The question is: have they complied with their contract? We say what may have preceded it is utterly and absolutely immaterial. It can illustrate no possible issue in this case. It can give the court no possible information. It can throw no possible light on any phase of the question presented to your Honor. You take this matter that he has offered here: What does he offer it for? To show conditions. What conditions? That the city wanted water works. Suppose they did? Suppose they made various propositions which had not been carried into effect? Suppose they appointed a committee of citizens? How does that illustrate this cause? Your Honor is not construing the contract. There is no issue as to the contract. I don't think we differ as to the construction of
278 the contract. If we do, no such matters as these can throw any light on it. The sole question is: Have they complied with their contract? Whatever preceded it we contend is utterly immaterial and is a burden to the record and tends to confuse the issues in the case.

The MASTER: Gentlemen, I don't see now, under the allegations in the bill, and in the absence of anything in the answer to connect it, that this record as contained in this paper marked "A" is exactly pertinent. I am inclined not to admit that paper "A" just at this time. I will say, if during the course of the case, you show that it is pertinent, I will admit it.

Mr. WIMBERLY: Then your Honor for the present admits "B" and excludes "A"?

The MASTER: Yes, sir. There is no objection to this paper "B." I don't know whether counsel on the other side wish to say anything further or wish to still object to it?

Mr. WIMBISH: Yes, sir; we have noted our objection.

The MASTER: I will let in this paper "B." "C," do you offer that now?

Mr. GARRARD: Yes, sir.

The MASTER: Any objection to that?

Mr. WIMBISH: No, sir.

The MASTER: I can see none to that.

(Counsel for complainant then read and offered in evidence the following marked "B" and "C" respectively:

279 *Extracts of Minutes of City Council of Columbus, Ga.*

"B."

COUNCIL CHAMBER, *Dec.* 30, 1878.

Adjourned Meeting.

"A communication from Mr. A. Wilkins, of Charleston, S. C., to His Honor, the Mayor, in regard to building water works was on motion of Alderman Scheussler, referred to the Mayor and Alderman Manley and Brooks for answer."

COUNCIL CHAMBER, *Feb.* 3, 1881.

Regular Meeting.

"By Ald. MANLEY: Whereas, a supply of good pure water is of the utmost importance to every community and calculated to add largely to the health and comfort of every city, and at the same time reduce the ordinary insurance risk on property, and in every way contribute to the welfare of a community, Be it Resolved, that the City Council of Columbus will hail with pleasure the organization of any responsible and competent company for the purpose of supplying the city with good, pure water, and will do all she can to make the undertaking a success, and will grant the right of way to all and any of the streets for the purpose of laying pipes and such other fixtures as may be necessary in constructing said water ways without any obstruction to the streets, and will give all the patronage she can consistently, to the enterprise.

Resolved, that we are satisfied that our citizens are anxious to secure this great boon, and will give to a properly organized water works company a hearty and material support both in sub-
280 scription for stock and a liberal use of the water.

Mr. A. Wilkins, of Charleston S. C. being present was requested to give some information as to cost of water works etc. He said that he thought that if the city would agree to take fifty hydrants for fire purposes, at eighty dollars each per year, he could guarantee water works with five miles of mains within a year. The resolutions of Mr. Manley were then adopted.

COUNCIL CHAMBER, *March* 2, 1881.

Regular meeting.

The following proposition for building water works was read.

(Here follows proposition from A. Wilkins, in behalf of himself and others who may hereafter become incorporated with him in a water company) proposing to construct an effective system of water works to supply the city and citizens of Columbus with water for domestic, manufacturing and sanitary purposes, as well as for the better protection of the city from the ravages of fire.

* * * * * * *

By Ald. DILLINGHAM: "Resolved that Messrs. John Hill and W. Riley Brown, citizens of Columbus, be requested to officiate as a committee of conference in concert with his Honor, the Mayor, and the chairman of the committee on contracts, to determine the policy of

his body, in regard to the communication from Mr. A. Wilkins, of Charleston S. C. respecting the erection and operation of
281 water works.

Ald. Brooks offered as a substitute the following.

"Whereas, from the rapid growth of our City in population and wealth, it is very evident that the time has arrived when it is all important that an ample supply of good pure water should be obtained not only for the private consumption of the citizens but for the better protection of property also, and as this desirable object can only be accomplished by the erection of water works, and as we fully believe that a very large majority of our citizens are not only in favor of them, but are hopeful that at an early period, a system will be adopted, that will fully meet their wants and necessities; therefore Be it Resolved

That we are favorably impressed with the proposition made to the City Council by Mr. A. Wilkins of Charleston, S. C. to erect water works in our city and that the same be accepted by Council.

Resolved, that a committee of three be appointed by His Honor, the Mayor, (the Mayor to constitute one of the committee whose duty it shall be to enter without delay into negotiations with Mr. Wilkins and make such a contract with him upon the basis of his said proposition to council, as will effectually secure to this city an ample and abundant supply of good pure water, and at as reasonable rates for rental as the average cities of Georgia are charged.

And as the said Wilkins, in his proposition to council, was undecided as to what plan or system he would adopt in the erec-
282 tion of said works, we would respectfully recommend that the distribution of water *water* be made on the gravitation plan being in our judgment preferable to any other.

Resolved, that said contract, when drawn up be submitted to council for approval before its final ratification.

Ald. Scheussler moved to amend by adding to the council committee W. Riley Brown and John Hill. Which amendment was accepted by Alderman Brooks, and the substitute as amended was adopted.

His Honor, the Mayor appointed Aldermen Manley and Everett, with himself, as that committee.

COUNCIL CHAMBER, *Sept.* 20, 1881.

Called Meeting.

His Honor, the Mayor, stated that it being the last of the extension of time to Mr. A. Wilkins for commencing work in the building of water works he had deemed it proper to call the board together to take such action in the premises as might be deemed proper. He had to day received a communication from Mr. Wilkins, dated 17th instant, saying that "owing to the fact that my party has recently taken some larger a*m*d more profitable contracts and the brevity of time given in the extension, I find I must forego the advantages which I had anticipated in the water works contract" etc.

Besides the above mentioned letter from Mr. A. Wilkins, several communications to the Mayor from A. H. McNeil, of Burling-
283 ton, N. J. and Thom. R. White of Philadelphia, relative to building water works were read.

By Ald. SHINGULEUR: "Whereas, it having been satisfactorily shown to Council that the contract entered into with Mr. Wilkins of Charleston, S. C. to build water works in the City of Columbus, has proved a failure, and that the said Wilkins has utterly failed to commence said work within the time specified in said contract, therefore, be it

Resolved, that the said contract between Council and the said A. Wilkins for the construction of said works, be and the same is hereby revoked and annulled.

Resolved, further, that a committee of five be appointed by the mayor, three of said committee to be members of council, his Honor, the Mayor to constitute one of the committee, and two from the citizens at large, to at once enter into correspondence with some responsible party to build said works in accordance with the agreement heretofore adopted by Council said committee being authorized to contract with said party without any further delay, provided said parties can give a satisfactory guarantee of their ability to complete said works in good faith.

Adopted, and his Honor, the Mayor, appointed the following committee: Ald. Shinguleur, Murdock, Messrs. W. Riley Brown and John Hill.

STATE OF GEORGIA,
County of Muscogee, City of Columbus:

I hereby certify that the foregoing five pages of type written
284 matter contain true extracts from the minutes of the City Council of Columbus, of the dates mentioned.

This the 19th day of September, 1903.

[SEAL.]

M. M. MOORE,
Clerk of City Council of Columbus.

Filed in Clerk's office 26 Sept. 1903.

O. C. FULLER, *Clerk.*
By N. A. BROWN, *Deputy.*

285 APRIL 5, 1882.

* * * * * * *

"The following report of committee on Water Works, assignment by Thos. R. White, with preamble and resolutions were read.

"To the Hon. Mayor and Council:

Your committee on Water Works beg leave to report, that the Columbus Water Works Company has been fully organized and the stock subscribed by the responsible parties.

Mr. White has transferred his contract to the Company, and your Honorable body is requested to ratify the same. The Company also desire- that privilege be given them to bring their pipes across the upper bridge, and to enter the City thereby. Believing that this can be done not only without injury to the bridge, but according to the plan suggested the bridge will be made actually stronger, we recommend permission be granted. The streets through which the

pes are to run have been designated and a plan thereof is herewith bmitted for the information of the board.

The Company also ask for a reasonable extension of the time for e completion of the contract, which we recommend be granted. our committee feel assured that this company will enter at once on the work and will push it forward to an early completion. All which is respectfully submitted.

BRANNON,
CURTIS,
Com. from Council.
JNO. HILL,
W. R. BROWN,
Com. from Citizens.

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"*Assignment.*"

GEORGIA,
Muscogee County:

For value received, I Thos. R. White, hereby transfer, assign and onvey to "The Columbus Water Works Company" all its rights, tles and interest that I have in, to and by virtue of a contract made nd entered into on the — day of October, 1881 between myself and he Mayor and Council of the City of Columbus, for the construction nd operation of an effective system of water works for the supply of he City of Columbus with water for the various uses required, etc." he said Columbus Water Works Company assuming all obligations o the said Mayor and Council under said contract and to have, pos- ss and enjoy all the rights, privileges and emoluments arising herefrom.

Witness my hand and seal this third day of April, A. D., 1882.

THOMAS R. WHITE.

Signed, sealed and delivered in the presence of:

CLIFF B. GRIMES,
Notary Public. [SEAL.]

"Whereas the Columbus Water Works Co. has been duly organized nd Thos. R. White with whom the Mayor and Council on the — lay of Oct. 1881, entered into a contract for the construction and peration of an effective system of water works for the supply of the City of Columbus with water for the various uses required,"
287 etc., has transferred and assigned his rights, title and interest under *siad* contract to the Columbus Water Works Company, herefore Be it Resolved by the Mayor and Council of the City of Columbus that they hereby ratify and assent to the said transfer and ssignment and recognize the said Columbus Water Works Co. as ssuming the obligations, and entitled to all the rights, privileges and emoluments arising under said contract.

Resolved further, that the Mayor and Council hereby grant to the aid Columbus Water Works Company an extension of the time, to-

wit, until the (Nov. 1)* day of 1882, for the completion of their said contract, as provided by the terms thereof.

Resolved further, that permission is hereby granted the said Columbus Water Works Company to bring their main water works pipes across the Chattahoochee River on the inside of the upper City bridge, and to keep said pipe upon said bridge, provided the same shall be done in such manner and upon such terms as the committee on water works shall approve of—not more than 15 inches in width of said bridge shall be used for such purposes."

On motion of Ald. Brannon the blank above was filled with "1st November" and the resolution then adopted. (The plan for laying pipes and plan for crossing the bridge were retained by the committee)."

* * * * * * *

COUNCIL CHAMBER, *Nov.* 1, 1882.

* * * * * * *

"Ald. Brannon stated that the water works would be tested
288 tomorrow afternoon at four o'clock, to which the Council and all citizens were invited, and suggested that a meeting of Council be held on Monday next to take such action as might be necessary in relation to the same." * * *

COUNCIL CHAMBER, *Nov.* 6, 1882.

* * * * * * *

COLUMBUS, GA., *Oct.* 31, 1882.

To the Hon. Mayor & Council of the City of Columbus.

GENTLEMEN: In behalf of Columbus Water Works Company the undersigned begs leave to inform your Honorable body that in accordance with the contract made between yourselves and Mr. Thos. R. White, and subsequently transferred to our Company, we have completed the system of water supply for your city, and Reservoir is amply provided, and the mains are now full, and the water ready for distribution and use, under the terms of said contract. We feel that we are justified in saying that the work has been done by our company in the most complete and substantial manner, in which neither time, labor nor expense has been spared, and in adding our assurance that the water supplied will be wholesome, abundant and lasting, and we trust that your Honorable Body, as well as the citizens of Columbus generally, will find everything connected with our work as satisfactory as we have endeavored to make it so. The magnitude and substantial character of the work, which has
289 greatly increased the expense of the undertaking to the Company, will we trust fully compensate for the delay in its completion.

The Company desires that your Honorable Body may take some official action signifying your acceptance of the work, and the adoption of such suitable measures as may be requisite for the more

[* In pencil in copy.]

fully carrying into effect the provisions of said contract. All of which is respectfully submitted.

B. F. ARCHER,
President Columbus Water Works Company."

It being stated that the filters of the Reservoir differed from the one prescribed in the contract, Mr. Thos. R. White was sent for, who explained that the one built was an improvement over the one described in the contract for the reason that it could be easily taken out and cleaned, which explanation was satisfactory.

The committee on water works offered the following, which was adopted:

"Resolved, that the Mayor and Council of the City of Columbus, being satisfied that the water works for the supply of water for the city and citizens of Columbus, has been completed by the Columbus Water Works Company in accordance with the contract made between the said Mayor and Council and Thos. R. White on the 7th day of October, 1881, and subsequently on the 3rd day of April, 1882, transferred to the said Columbus Water Works Com-
290 pany, and the said Mayor and Council hereby accept the same, and the committee are hereby authorized to locate drinking fountains and adopt such other measures that may be necessary for the full execution of said contract."

Ald. W. H. Brannon, N. N. Curtis, Mr. Jno. Hill, Mr. W. R. Brown, Com."

* * * * * * *

COUNCIL CHAMBER, *July* 7, 1883.

* * * * * * *

"To the Hon. Mayor and Council:

Your Finance Committee would report that the contract with the water Works Company provides that fifty double hydrants shall be placed on the original five miles of street distribution, making in all one hundred hose connections. It further provides that the rent for said hydrants shall be $80 each; equal to four thousand dollars per year payable quarterly; and on future extensions the rate shall be $75 per hydrant. The fifty double hydrants as per contract have been located, reported by your water committee and received by the City. Now the Water Works Company continue the extensions of their water main and ask your water committee to locate other hydants.

The financial basis for the year 1883 was made upon the
291 rental of $4000 for water supply, and your committee deem it their duty, and advisable to call your attention to this matter, and have you to say whether the number of hydrants shall be increased or not. We further report that there are now some half dozen or more located or in process of location.

Respectfully.

BRANNON, CURTIS, JORDAN,
Committee."

On motion of Alderman Kyle, it was resolved that Council would accept not exceeding ten hydrants this year, in addition to the fifty originally contracted for—the same to be located by the committee on water works."

* * * * * * *

COUNCIL CHAMBER, *July* 4, 1883.

* * * * * * *

"The following report was received.

"Your committee on water works report that, in company with Mr. Yocum, Superintendent, they visited the extension on Oglethorpe and Mercer Streets, and located six hydrants, four on Oglethorpe and two on Mercer. Mr. Yocum was informed that Council had resolved that it would only take ten hydrants this year in addition to the number in original contract, and that if these six were put in as per location, the Water Works Company would not receive any pay for same until Council saw proper to do so. The hydrants have been placed and it is now with the Council as to their use and pay.

BRANNON,
EVERETT,
Committee."

292 Ald. Curtis moved that, in case of the use of the hydrants the committee be authorized to confer with the Water Works Company and agree upon the price to be paid for said use. Agreed to." * * *

STATE OF GEORGIA,
County of Muscogee, City of Columbus:

I hereby certify that the foregoing five typewritten pages contain true and correct extracts from the Minutes of the City Council of Columbus, of the dates named.

This the 19th day of September, 1903.

[SEAL.] M. M. MOORE,
Clerk of City Council of Columbus.

Filed in Clerk's office 19 Sept., 1903.

O. C. FULLER, *Clerk,*
By N. A. BROWN, *Deputy.*

293 Mr. GARRARD: We tender this answer to the notice to produce.

(Said answer was objected to on the ground that the same was not a full and complete answer to the notice to produce; and further that the notice does not show why the books called for did not go into their custody and control; and the notice does not say why it is not in their control and does not show what efforts have been made to get the books; and further that it is a response by the president of the company; that there being a secretary of the company he should have charge of the books called for; and that the affidavit of the

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secretary should also be had; that the president can only know that the books called for are not in the custody or control of the company by hearsay.)

The MASTER: You can serve any other notice on anybody that you think can respond to this notice. The president of a corporation, as a general rule, he is the officer whose business it is to know where these things are. If he swears positively that he has not got them, it does not lay in the court's mouth to say that he does know. I will give you any order to produce them if you know who has got them or can account for them. If you want to put any notice on anybody else connected with the corporation I will be very glad to give you the order.

Mr. MARTIN: We may ask for it.

Mr. WIMBISH: If we amend the bill and pray discovery will that interfere with the present hearing?

Mr. WIMBERLY: I don't know how serious your amendment would be. I am not prepared to say how long it would take
294 us to answer that branch of it.

Mr. WIMBISH: Of course they would have to have time to answer that branch of the case.

The MASTER: Before I finally rule that this is sufficient, I will give you gentlemen an opportunity of showing me that somebody other than the president should answer this notice.

Mr. WIMBISH: We will probably endeavor to do so by the opening to-morrow morning.

(Court here took a recess until the next day.)

FRIDAY MORNING, *February* 5, 1904.

Court met pursuant to recess and the hearing was resumed.

The MASTER: In this matter that we had under advisement on yesterday, to produce papers, I will ask you to read me the verification of Mr. Epping.

Mr. GARRARD: I will have that changed and present that later. I will have it typewritten over. I was under the impression that the affidavit was an unqualified affidavit upon the truth of the answer. I notice upon an inspection of the answer that he swears to his knowledge and belief as to his own acts.

The MASTER: If you want to continue this matter on this notice, I am ready to hear from you.

Mr. WIMBISH: I thought I would look up the authorities but I have not had time to do so and we don't care to urge it any further. We have stated to the court what we thought would be a proper response.

Mr. GARRARD: I will bring that up later.

295 Mr. WIMBERLY: I will now ask your Honor to so modify your ruling on yesterday to let us use that paper marked "A," reserving until a later——

The MASTER: "A"?

Mr. WIMBERLY: The one on yesterday that your Honor was not disposed to admit. It was used on the hearing before Judge New-

SE IN CENTER

man; and I take it under the rule just read, documents that have been used on any part of the hearing may be used before the Master.

The MASTER: Was that paper used before Judge Newman?

Mr. WIMBERLY: Yes, sir.

The MASTER: I did not so understand it.

Mr. WIMBERLY: Yes, sir; it was used before Judge Newman.

The MASTER: Is it of file in the case?

Mr. WIMBERLY: Yes, sir.

(This paper was objected to for the reasons stated by counsel for defendant heretofore when the paper was first offered in evidence.)

The MASTER: I could not admit that as evidence. I don't think it is admissible in the case.

* * * * * * *

Mr. MARTIN: On yesterday the complainant offered certain copies which do not purport to be the originals, because the blanks are not filled in, for instance the mortgage of 1882. We want now to make a motion to rule out those mortgages and object to their being introduced in evidence, upon the ground that they have not shown any authority before this court for the issuance of those mort-
296 gages. This now is a proceeding of the bondholders against the City of Columbus. The City of Columbus is no party to these mortgages. That was a matter between the trust company and the Columbus Water Works Company. * * * We object to these, because there is no authority shown from the records of the company or the books of the company showing that they had any authority to issue those mortgages. The recitals in those mortgages are not an estoppel against the city. May be against the water works company but not against the city; and before they can get them in as evidence before this court, they must show that they had authority to issue them. Therefore, we object to the admissibility of those mortgages unless they first produce their books of minutes of the stockholders' resolutions giving them authority to issue them.

The MASTER: I understood those mortgages were introduced in evidence and there was no objection to their going in.

Mr. WIMBERLY: Yes, sir.

Mr. MARTIN: But this is a motion to rule out.

The MASTER: It seems to me you should have objected on yesterday.

Mr. MARTIN: We never did consent or state on yesterday that we had no objection. We object to them as evidence before this court because they have not shown any authority to issue them. I confess that matter did not occur to me on yesterday.

The MASTER: I will let them stay in. You should have
297 made your motion on yesterday evening.

Mr. GARRARD: Here is an extract certified to by M. M. Moore, extract from council proceedings, certified to by M. M. Moore, Clerk of Council. Report of George J. Burrys, Chief of the Fire Department, for 1891. We merely offer this and not the books; because there is a great deal in the books that do not refer to water works at all. (Marked "D.")

Mr. MARTIN: Our objection to that it is not legal testimony. What an officer of the City of Columbus might report to Council is not legal testimony. That witness could be brought here and they could put him upon the stand. The official action of the council would be proper testimony; but what an officer might report to council is not legal testimony; and should not be binding upon the city.

* * * * * * *

The MASTER: This is a certified copy of what purports to be the minutes of council of the City of Columbus. There is an informality in the certificate of the clerk of council which the other side has waived. The question is as to the admissibility of the evidence. I will admit it; but as to how far it should be taken as against the city, why that would be a matter for you gentlemen to argue to me. I will let it — for what it is worth; but as to whether I will consider it in making up my conclusions and giving it the weight of sworn evidence, that will be another matter for you gentlemen to argue, which you can do later.

298 *Extracts of Minutes of City Council of Columbus, Ga., Offered by Compl't's.*

STATE OF GEORGIA, *County of Muscogee:*

I hereby certify that the following six typewritten pages contain true extracts from the official annual reports of the City Officials of Columbus named therein, and for the years stated, as shown by minutes of Council.

M. M. MOORE,
Clerk Council.

Geo. J. Burrus, Chief Engineer Fire Department, 1891.

"Water Supply."

"The pressure at all times has been up to the standard, and the supply ample. * * * When the mains were extended to near 20th Street on 3rd Avenue, I gave a test of pressure at that point through 150 feet of hose and a ¾ inch nozzle, we were able to throw water about 20 feet high, and in my opinion we were on a level with the pavilion on Rose Hill. If so, the question of water in the Annex is solved, and I ask that the matter be definitely ascertained, and if I am correct, I ask that you give the matter your immediate attention. As I was an unwilling witness at the burning of eight houses in that part of the city and was unable to do anything for them for the want of water, I recommend that you have a plug placed at the following locations: Corner of 5th Ave. and 9th, 6th Ave. and 9th, 8th Ave. and 9th, and the corner of 1st Ave. and 14th Street."

299 Geo. J. Burrus, Chief Engineer, Fire Department, 1892.

"Water Supply."

"The pressure has at all times been up to the required standard, as the register in my office will show."

Geo. J. Burrus, Chief Engineer, Fire Department, 1893.

"Water Supply."

"There has been no scarcity of water where the mains reach, at any time, and the pressure, according to the *guage* in my charge, with very few exceptions, has been up to the required standard. I would most respectfully suggest that as early as possible some provision be made to supply the Annex with water. I most respectfully refer *to* your Honorable body to my report of 1892 where new plugs are needed."

James J. Slade, Mayor, 1894.

"Water Works."

"Again I appeal for the practical business solution of this question. It is my earnest desire that a full and just settlement of this question will be reached at an early day, upon sound business principles."

Geo. J. Burrus, Chief Engineer, Fire Department, 1894.

"Water Works."

"The pressure according to the *guage* in my charge, shows an average pressure of 40 pounds. The Columbus Water Works Co. attached the upper reservoir to the supply pipe during the year, and when it was turned on the *guage* indicated 55 pounds pres-
300 sure. They also have put in a telephone at the reservoirs, and in case of a fire I am authorized to call the watchman and have him turn it on. I have not yet tried the plan to see how it would work, but I am confident it will be quite an improvement."

James J. Slade, Mayor, 1892.

Fire Department.

"Another year of no disastrous fire waste has heaped well earned honors upon the fire department and its skillful chief. Its promptness and the ready response of the water supply to the standard of pressure required have permitted no fire to make destructive headway."

Geo. J. Burrus, Chief Engineer, Fire Department, 1895.

"Water Supply."

"During the protracted drought of the past few months, the *guage* in my charge has averaged 40 lbs. I again call attention to my previous reports in regard to water for the annex."

Geo. J. Burrus, Chief Engineer, Fire Department, 1896.

"Water."

"The pressure on the mains is, as before stated in previous reports, an average of 40 pounds per square inch. The Water Co. is now having constructed on Rose Hill a Stand Pipe 20 x 120 feet which will give that part of the city ample water for fire protection. I am told that they also intend to offer the city a part of the lot
301 on which the stand pipe is built for an engine house. If such be the case. I would advise the acceptance of same. As the location is nearer the center of the new part of the city and of easier access to all parts than the present location. Beside they intend to connect the old part of their works with the new, and agree to put the new stand pipe in charge of the fireman if located there. And when so ordered by signal or otherwise, they can turn on the water and increase the pressure in the old part of the city to about eighty or ninety pounds."

Geo. J. Burrus, Chief Engineer, Fire Department, 1897.

"Water Supply."

"The Columbus Water Works Co. continues to furnish water at an average pressure of forty pounds."

Geo. J. Burrus, Chief Engineer, Fire Department, 1898.

"Water Supply."

"The pressure remains the same as former reports. But when the water company completes the new contract made with your Honorable body we will undoubtedly have better results. They have completed the mains laid out for the annex. And by keeping up the supply of water in the Rose Hill stand pipe the pressure will be ample for that part of the city."

Geo. J. Burrus, Chief Engineer, Fire Department, 1899.

"Water Supply."

302 "I regret that I cannot report an improvement in the water pressure, and at times it has been lower than for previous years. The disastrous result of the fire on Sixth Avenue was directly the cause of low pressure.

I am informed by the water company that they have placed a powerful pump at the Columbus Railroad Power House with a sealed suction in the river, said seal only to be op-ed by orders of the Mayor or Chief Engineer of the Fire department, thereby giving the city an unlimited supply of water at all times, but they will use the water from their own mains (except in case of an emergency) and promise a pressure when called for of at least eighty pounds per square inch, which in my judgment will be sufficient in case of an ordinary fire."

Lucius H. Chappell, Mayor, 1900.

"The Columbus Water Works Company have furnished to the city throughout the year pure and wholesome water in ample quan-ity. The installation of their force pump, operated by water at the power house, and of their second pump, operated by steam, completed the work of supplying water in the Up Town District from the Rose Hill stand pipe. After a thorough test, the Committee on Water works, being satisfied that the terms of the agreement had been properly complied with, recommend that the fifty additional hydrants be placed on the pay roll from the date of this test."

303 I. F. Pierce, Chief Engineer, Fire Department, 1900.

"During the year thirty five new hydrants have been erected in different sections of the city. Twenty five of them were placed on Rose Hill, North Highlands and East Highlands, all of which have greatly facilitated our means for giving effectual service in that portion of the territory. These plugs are supplied *form* the Rose Hill stand pipe. The valve placed at No. 1 Engine House, whereby we are enabled to get the benefit of the Rose Hill Stand Pipe and the powerful pump at the Columbus Railroad Power House will in my judgment, give sufficient pressure in case of all ordinary fires in the lower part of the city."

I. F. Pierce, Chief Engineer, Fire Department, 1901.

"Water Supply."

"The valve placed at No. 1 Engine House, whereby we are enabled to get the benefit of the Rose Hill stand pipe, and the powerful pump at the Columbus Railroad Company's power house has given sufficient pressure for all ordinary fires in the lower part of the city. The value of this high pressure water service has been fully demonstrated, as we have had but one occasion to use the steamers during the year."

Lucius H. Chappell, Mayor, 1899.

"The Columbus Water Works Company have supplied the City with good and wholesome water during the past year and in ample quantities, for all practical purposes."

M. M. MOORE, *Clerk C.* [SEAL.]

304 Filed in Clerk's Office 26 Sept., 1903.
O. C. FULLER, *Clerk*,
By N. A. BROWN, *Deputy*.

305 Complainant tendered in evidence the following extract of minutes of council marked "E":

COUNCIL CHAMBER, *April* 4, 1888.

"The Committee on Water Works submitted the following communication to them from Mr. Archer, President of the Columbus Water Works Company:

"To Messrs. T. M. Foley, E. S. McEachren, A. M. Elledge, Committee on Water Works.

GENTLEMEN: The Water Works Company of Columbus would respectfully petition the Hon. Mayor and Council, through your committee:

1st. That the mayor and council would rescind the resolution demanding of the water works company a removal of the water works main from the river bridge.

2nd. That the mayor and council will grant to the water works company the privilege of erecting in the streets of the city, (at such point as you may designate), a standpipe of the following capacity and dimensions; to be of proper proportions at its base, and 120 feet from the ground to the top and ornamental construction; said standpipe to be erected before September 1st prox.

In making the request set forth in number 1. herein, we beg to state that we ask it to avoid the heavy expense attendant on the removal and the length of time that would be absolutely required to remove it; and because we believe that the pipe as located is as comparatively safe as it can be made. But to remove any doubt as to the safety of the bridge from damage by weight of the pipe, we hereby promise, within a reasonable time, to build upon the piers (with brick or iron columns) now supporting the bridge, up a sufficient height to support the pipe; the city reserving any and all
306 rights she may have to pass a similar resolution in the future, if in their judgment it may be deemed necessary.

In making the request set forth in No. 2 herein, we simply desire to add to the pressure on the mains, and have an additional water supply in case of casuality, so that there will be an adequate supply of water in any emergency.

Your obedients servants,
COLUMBUS WATER WORKS COMPANY,
Per B. F. ARCHER, *Pres't*.

The committee also offered the following resolution:

Resolved, that the resolution passed April 6, 1887, notifying the Columbus Water Works Company to remove their pipes from the upper bridge, be, and the same is hereby rescinded." Adopted.

On motion of Ald. Dozier, so much of Mr. Archer's petition as referred to the erection of a standpipe, was referred to committee on water works with power to act.

COUNCIL CHAMBER, *June* 6, 1888.

"The committee on water works stated that the differences with the water works company had been arranged, and they had approved the bills of the company for the first five quarters and asked that their action be ratified, which was done."

COUNCIL CHAMBER, *December* 10, 1888.

Water Works.

"Your committee on water works are pleased to report the
307 very marked improvements in the water service furnished you during the past year by the Columbus Water Works Company, who have shown a disposition to meet and remedy all reasonable complaints of our citizens. We have every assurance that the water company will endeavor to further improve its service. The costly standpipe recently erected is an evidence of this purpose on the part of the company.

Six fire hydrants have been added to the system during the past year, and your committee take the liberty of suggesting further extensions of the water mains during the coming year, particularly in the southern portion of the city.

The disbursements for water during 1888 amount to $8,606.25, a portion of this sum is the item of deferred rents for 1887.

Respectfully submitted,

FOLEY, ELLEDGE, McEACHERN,
Committee."

COUNCIL CHAMBER, *July* 16, 1889.

Water Works.

"To the Hon. Mayor and Aldermen of the City of Columbus.

GENTLEMEN: Your committee on water works are pleased to report the very marked improvements in the water service furnished you during the past year by the Columbus Water Works Company, who have shown a disposition to meet and remedy all reasonable complaints of our citizens. We have every assurance that the water works company will endeavor to further improve its service.
308 Two fire hydrants have been added to the system during the past year, and your committee take the liberty of suggesting further extensions of the water main during the coming year, particularly in the southern and northern portion of the city. The disbursements for water during 1889 amount to $5,235.85.

Respectfully submitted,

J. D. McPHAIL,
ROLLIN JEFFERSON,
J. F. CLEGG,
Committee."

By-pass for clear water

EXHIBITS

NOT

SUITABLE

FOR

MICRO-

FILMING

STATE OF GEORGIA,
County of Muscogee, City of Columbus:

I hereby certify that the foregoing three typewritten pages contain true and correct extracts from the Minutes of the City Council of Columbus.

This 19th day of September, 1903.

M. M. MOORE,
Clerk of City Council of Columbus.

309 It was admitted that the exhibits attached to the original bill filed by complainant were correct.

In addition to the foregoing, counsel for the complainant stated that the exhibits attached to the original bill filed by complainant, showing the subsequent action of council, from last named date, were tendered in evidence.

(See exhibits commencing on page 36 and ending on page 92, volume 1.)

Mr. GARRARD: We tender this map of the City of Columbus, showing the location of the pipes in the City of Columbus.

(Map in question being one containing the following as identification: "Frank U. Downing, Draughtsman. Published by A. E. Lytle, Mgr., Baltimore, Md., 1901.)

Mr. WIMBISH: The only objection we have to this or the only one that we care to urge now is, the matter of getting it into the record. There are on here a whole lot of specifications, etc., that are entirely immaterial to this case. * * * We have no objection to the map going in so far as it is pertinent. I should think the water company has a map showing the mains in the city.

The map was not admitted in evidence, the Master stating that he would not allow it to go in evidence unless it was proven to be correct.

It was admitted that the following photographs were correct; and tendered in evidence by complainant:

(Here follow Exhibit D, marked p. 310; Exhibit C, marked p. 311; Exhibit A, marked p. 312, and Exhibit B, marked p. 312*a*.)

313 *Extracts of Minutes of City Council of Columbus, Georgia.*

Complainant introduced the following extract of minutes in evidence (marked "F").

COUNCIL CHAMBER, *Nov.* 26, 1894.

Called Meeting.

The following from the Columbus Water Works Company was read and on motion of Ald. Rankin received:

COLUMBUS, GA., *Nov.* 10, 1894.

At a meeting of the Board of Directors of the Columbus Water Works Company this day held at the office of the company in the city of Columbus, the following proposition was unanimously adopted, and the Secretary of the Company was directed to hand a certified copy of the same to the Clerk of the City Council of Columbus.

To the Mayor and Council of the City of Columbus:

The Columbus Water Works Company desires an adjustment of the present status of affairs existing between this company and the City of Columbus on business principles. It is needless to waste time in discussing the past. What we want is to act as regards the future. The question of furnishing additional pressure has been a vexed one, but we are now prepared to furnish all additional pressure needed or desired including pressure for Rose Hill and the Highlands. We can and will furnish all the water the city wants now or in the future. And for the purpose of settling all questions at issue between our company and the city, we now make this proposition; that we submit all questions of difference between us to a Board of Arbitration to consist of three impartial persons, one member to be chosen by the City Council and the other to be named by the water works company, and these two persons so chosen
314 to select a third arbitrator and this Board to be sworn and to act according to the laws of Georgia relating to arbitrations and the judgment of said arbitration is to be final and not to be appealed from or excepted to by either party, and to be made the judgment of the Superior Court of Muscogee County.

We are willing that every disputed question shall be finally settled including pressure, amount of water, prices of water both to the City and consumers, extension of system to Rose Hill and the Highlands. This, we believe includes all points of difference.

A true copy from the minutes.

J. G. BEASLEY,
Secretary of the Board of Directors.

Ald. Rankin offered the following resolution which was adopted:

Resolved, that the proposition of the Columbus Water Works Company to submit the water works question to arbitration be rejected.

First. On the ground that an ordinance submitting the question to a popular vote has been passed and advertised and it would require two regular meetings of Council to repeal the same.

Second. On the ground that there is nothing to arbitrate.
Third. One the ground that the Council is only a servant of the people, and the Constitution of this State requires all such
315 contracts if made for a longer period than one year be submitted to a popular vote."

STATE OF GEORGIA,
County of Muscogee, City of Columbus:

I hereby certify that the foregoing two pages of typewritten matter contain true extracts from the minutes of the Proceedings of the City Council of Columbus, Georgia, at called meeting held on November, 26, 1894.
This September 26, 1903.

M. M. MOORE,
Clerk of City Council of Columbus.

Filed in Clerk's office 26 Sept. 1903.

O. C. FULLER, *Clerk.*
By N. A. BROWN, *Deputy.*

316 Complainant offered in evidence the following extract of minutes of council marked "G."

STATE OF GEORGIA,
Muscogee County:

In person appeared before the undersigned, W. Cecil Neill, who, being duly sworn, deposes and says, that he has examined the Records of the Proceedings of the City Council of Columbus, Georgia, and that the following is an extract from the Proceedings of said City Council on June first, 1898, to be found on pages 533 to 535 of Book K of said Records:

"The following report of a special committee was received and adopted, all voting aye on call of ayes:

COLUMBUS, GA., *May* 31, 1898.

To the Honorable Mayor and Board of Alderman, Columbus, Ga.

GENTLEMEN: We the undersigned, special committee, appointed at the April meeting, with instructions that we endeavor to obtain from the Columbus Water Works Company a proposition, the acceptance of which we could recommend, looking to the extension of the Water works system to those parts of the City of Columbus which are not now provided with water works; submit herewith a proposition from the water works Company, which we recommend that this council accept.

Respectfully,

N. L. DUDLEY,
J. T. COOPER,
R. M. KIRVEN,
F. C. REICH,
JAS. A. LEWIS,
Committee.

317 To the City of Columbus:

The Columbus Water Works Company desires to submit the following proposition: To lay off the City of Columbus into two water districts, one to be known as the Upper Town, or Rose Hill District, including all of the City North of Fourteenth Street, to be supplied with water forced into the Rose Hill stand pipe the other to be known as the Down Town District, to be supplied with water from the present Broad Street stand pipe; the two districts to be so connected, by proper valves, that at any time, the Broad Street stand pipe could be cut off from the Lower Town district, and the Upper Town or Rose Hill stand pipe could be connected with the Down Town mains. Thus enabling the city in case of fire, to get the advantage of the elevation of the Rose Hill stand pipe. The base of the Rose Hill stand pipe is ninety feet above the level of the market house floor; the height of the Rose Hill stand pipe is 120 feet above its base, making a total elevation of 210 feet, above the floor of the market house.

We promise to use two pumps, with a combined capacity of fifteen hundred thousand gallons per 24 hours; these pumps to pump water into the Rose Hill stand pipe, to its full capacity, and keep it filled (a *guage* to be attached to said stand pipe and placed under the exclusive control of the city, which will at all times indicate the height of the water in the stand pipe), and in case of emergency, pump directly into all the mains. These pumps would pump di-

318 rectly out of the main, leading across the river and not from the Broad Street stand pipe, the water in the stand pipe standing as a reserve. We should expect the city to pay for this additional service the sum of two thousand dollars per annum, and for this amount we would furnish the city fifty additional fire hydrants to be placed at such points, in the newly annexed territory, as might be designated, or at such points in the older part of the city, or new extensions, as the city might designate; said hydrants to be placed at an average distance apart of Six hundred feet, and to be so located that the aggregate distance between them shall amount to thirty thousand feet (30,000) feet. These hydrants are in no way connected with or included in the proposition heretofore made to supply the city with 100 additional fire hydrants, in the old part of the city, and on the old mains in the city, without additional cost. We still stand ready and willing to carry out the proposition in regard to the one hundred additional fire hydrants, heretofore made to the city.

The practical result of these extensions would be that the City of Columbus would have two hundred and Fifty hydrants, at a cost of nine thousand seven hundred and fifty dollars per annum.

No pipe for mains less than six inches interior diameter will be used, and the pipe leading from Seventeenth Street to the Rose Hill stand pipe shall not be less than eight inches interior diameter.

The laying of the last five thousand feet of mains and the

319 placing of hydrants thereon will be deferred until twelve months after this date, but the payments by the city shall begin as soon as twenty five thousand feet of mains shall be laid and

the hydrants thereon ready for use, and the following test has been made, namely Two lines of city fire hose of five hundred feet each, with ordinary hydrant nozzles of not over one inch in diameter each, shall be attached to a double fire hydrant, at the intersection of Sixth Street and Sixth Avenue; then the fire pressure is to be applied and two streams of water are to be forced through the two lines of hose, and the pressure gauge located on the water main within six feet of the hydrant used, shall within ten minutes from a signal given by the water company, register and maintain a pressure of not less than forty pounds, while both streams are flowing.

This test to be continued for thirty minutes. This test to be repeated until successful. Within thirty days from the acceptance of this proposition by the city of Columbus, the Rose Hill stand pipe will be filled with water by the use of one of the city steamers, or otherwise, as the Columbus Water Works Company may elect, and kept full until the water works company's pumps are ready for use, but no charge shall be made for the use of this water at hydrants supplied therefrom in the Rose Hill annex, until the proposed extension of the Columbus Water Works Company's system is completed and tested, as above stated.

If this proposition is accepted, we will begin the work,
320 without delay, and push the same to rapid completion.

Respectfully submitted,

THE COLUMBUS WATER WORKS COMPANY.

A true extract from the minutes of the meeting of the Board of Directors of the Columbus Water Works Company, held this the 30th day of May, 1898.

LOUIS F. GARRARD, JR.,
Secretary and Treasurer."

That pages 309 and 310 of Record Book L of the proceedings of the City Council of Columbus contains the following:

"The following communication from the Water Works Company was received.

COLUMBUS, GA., *April* 4, 1900.

To the Honorable Mayor and Council of the City of Columbus, Ga.

GENTLEMEN: We beg to inform you that we have complied with our proposition to extend and improve this system of water works made you on May 30, 1898, and accepted June 1st 1898, and have demonstrated by actual test that we can quickly apply increased water pressure whereever required by the Chief of your Fire Department.

Yours truly,

COLUMBUS WATER WORKS COMPANY,
By H. H. EPPING, *President.*"

"The proposition of the Water Works Company (of record on page 533 Book K Minutes of Council) was read, also the fol-
321 lowing report of the special committee to whom it had been referred:

COLUMBUS, GA., *April* 4, 1900.

"To the Honorable Board of Aldermen of Columbus, Ga.

GENTLEMEN: At the regular meeting of this Board on June 1, 1898, the accompanying proposition submitted by the Columbus Water Works Company was upon the recommendation of a special committee appointed for the purpose accepted by the Board of Aldermen; said special committee was composed of Aldermen Dudley, Reich Kirven, Lewis and Cooper. Of these only Messrs. Lewis and Cooper are now members of this Board. On April 3, 1900, at 11:20 A. M. a test of the pressure was made in the presence of the Mayor, chairman of the Committee on Water Works (Ald. Marcrum) and of Cisterns and Fire Department (Ald. Wilson), Ald. Beach being also present and the Chief of the Fire Department. The result of the test was as follows: Two lines of city fire hose of four hundred and fifty feet each were attached to the double hydrant at the intersection of Sixth Street and Sixth Avenue; the fire pressure applied and two streams of water forced through said lines of hose with nozzles of one inch and ⅞ inch respectively in diameter. The pressure *guage* located on the water main within six feet of the hydrant registered within ten minutes a pressure of sixty pounds to the square inch, and maintained said pressure for thirty minutes,
except during an interval of about ten minutes, during which
322 a two and a half inch stream was being drawn from the main
with no nozzle, and the pressure fell to 41 pounds, reacting to sixty pounds when the 2½ inch stream was cut off. At no time during the test did the pressure fall below 41 pounds to the square inch.

That part of the proposition dividing the upper town from the lower town district at 14th Street has not been compiled with, as the dividing line now is on 17th Street.

The company has two pumps the capacity of which we do not know, but we call attention to the fact that only one of these can be put in operation instantaneously, the second being operated by steam and not fired until needed.

No *guage* has been attached to the Rose Hill stand pipe and placed under the exclusive control of the city. The pumps do not pump directly into all the mains but pump into the Rose Hill stand pipe. The pipe leading from 17th Street to the Rose Hill stand pipe is only six inches in diameter.

It will be seen that some changes have been made in the original plans as outlined in the proposition accepted by the City and before accepting the fifty hydrants, we would recommend that a special committee of five be appointed whose duty it shall be to make a thorough examination and report back to council at their next regular meeting, as to whether or not the system as it now stands is as good as, or better than, outlined in the proposition accepted by the City.

323 Respectfully, L. H. CHAPPELL, *Mayor.*
W. E. MARCRUM,
Chairman Committee on Water Works.
B. F. WILSON,
Chairman Committee on Fire Department.

"Ald. Dismukes moved that the report be received and a special committee, as recommended be appointed. Adopted; and his Honor Mayor Chappell, appointed Ald. Slade, Cooper, Lewis, Marcrum and Wilson, as that Committee."

That page 314 of same Book contains the following:

MAY 3, 1900.

"The following resolution by Ald. Wilson laid over from last meeting was read and adopted:

"Whereas, it is the sense of council that it is desirable that in all fires that the additional pressure of the water mains to be obtained by connecting the Rose Hill stand pipe should be made available on all connections, and it having been suggested by the chairman of the committee on cisterns and fire department that the Columbus Water Works Company make an electrical connection with the fire alarm telegraph and their pump at the power house and pumping station, so that when the fire alarm bell rings, a gong will ring automatically at the pumping station; and it being understood that the officers of the water works company have expressed a willingness to adopt the plan suggested.

"Therefore, it is resolved, that such an arrangement meets
324 the approval of council and that the Columbus Water Works Company are requested to put in operation the plan, so that on all occasions when the fire gong rings at the pumping station, the man in charge there shall immediately connect the pump and the Rose Hill stand pipe with the lower town mains, so as to make the added pressure available for all fires."

That same Book L contains the following:

Page 316.

COLUMBUS, GA., *May* 3, 1900.

"The following report of special committee was received and adopted:

To the Mayor and Council, Columbus, Ga.

GENTLEMEN: Your committee, to whom was referred the proposition of the Columbus Water Works Company in reference to the Rose Hill stand pipe made to the city council May 30, 1898, and accepted June 1, 1898, also the communication of the Water Works Co. dated July 27, 1899, asking permission to use two 6 inch connections between Rose Hill stand pipe and 17th Street, instead of one eight inch pipe as proposed and accepted, also the letter of the Water Works Company notifying the city that they had complied with the agreement; also the report of the mayor and committee on cisterns and water works giving results of tests of water pressure made April 4th, 1900.

We find that the agreement has not been complied with in the following respects:

First. The eight inch pipe connecting Rose Hill stand
325 pipe and 17th street main has not been laid but instead two six inch pipes have been laid, one down Hamilton Avenue to

Seventh Street along route proposed to lay the 8 inch pipe, and one out 22nd street to 2nd and 3rd Avenues, and thence down same to 17 Street.

Second. The line of division between the upper and lower town fire districts has been made at 17th Street instead of 14th Street as agreed.

Third. That only one pump has been placed at the end of the main crossing the river, for the purpose of forcing the water into the mains and standpipe, instead of two as agreed.

Fourth. No arrangements has been made for forcing the water directly into the mains from the pumps.

In regard to first item, we recommend that the Water Works Co. be not required to lay the 8-inch pipe from the Rose Hill stand pipe to Seventeenth Street, as said 8-inch pipe would connect with 6-inch main at Seventeenth Street and as good or better service can be obtained by the two 6 inch pipes now in use.

In regard to the second item, we recommend that the Water Works Co. Be required to make the dividing line between upper and lower fire districts on 14th Street, as agreed, and to make proper arrangements for promptly turning on the water from upper to lower town when it shall be necessary, as this places three entire rows of
326 blocks directly under the protection of the pressure at all times furnished by the Rose Hill stand pipe.

In regard to the third item, we recommend that the Water Works Co. be required to place the two pumps of required capacity at the pumping station; and the same be kept always ready for use.

In regard to the fourth item, we recommend that the Water Works Co. Be not required to put in the check valves, for purpose of pumping exclusively into the mains, at present, but that the city reserve the right to require said check valves be put on when it shall be deemed necessary.

When these requirements are complied with we recommend that this system shall be placed on the pay roll at the rate agreed upon, two thousand dollars per year. The beginning of the time for which payment is made to date from April 4th, the time of the test as to the pressure.

Respectfully submitted,

R. W. SLADE, *Chairman*,
JAS. A. LEWIS,
J. T. COOPER,
B. F. WILSON.

That the same Book L/ contains the following:

Page 323.

JUNE 6, 1900.

"The following report of special committee was received and adopted:

To the Mayor and Council of Columbus:

GENTLEMEN: Your committee to whom was referred the
327 adjustment of the differences between the City Council and the Columbus Water Works Company, in the matter of in-

$27,000 per annum. The Works have been built since 1882, since which the population of Columbus—now 30,000 and growing quite rapidly—has been nearly doubled. It is a gravity system, with ample supply, no pumping necessary, pipes all in good order for present service but needing enlargement in the not very distant future. The Works are just passing into the hands of my friends from the original constructors, who were Philadelphians, and should in the future under their management be made to grow very much more rapidly than heretofore. There are now $150,000 of bonds on the property, which together with all the stock will come into their hands, and they propose to cancel the original mortgage
359 of $150,000 and authorize a new one for $500,000, sell $325,000 as above, and put $175,000 in the hands of a Trustee to be used only under the Trustee's direction for future additions to the property as needed. The City already pays between $9,000 and $10,000 hydrant rental, and the coupons of the bonds will be receivable for city taxes up to the amount of whatever the city's payments are, and this ought to soon take care of the interest on the whole $325,000 of bonds. You will observe that there is a margin of net now of thirty per cent. above the 6% on $325,000 of bonds.

If you should agree to make the negotiation I think you could get the bonds at 90. The new mortgage could be drawn to your satisfaction, and you could name the Trustee.

The friends above referred to would be willing to take $50,000 of bonds if you should make up a little syndicate. One of them is the president of the leading bank at Columbus—the Chattahoochee National—thoroughly conservative and sound, and he would take the presidency of the company. They represent (and their judgment is good upon such a subject) that all of the bonds could be placed in Columbus, probably within six months, at a good profit, and in this they would assist.

If you are disposed to consider the matter please telegraph me to-morrow Tuesday morning, as I am to meet them at twelve o'clock.

360 They would then either go to Baltimore or ask you to come here. They want to return home within the next few days.

Kindly regard as confidential, except to such people as you would want to take part in case you take the matter up.

Very truly yours, S. SPENCER.

361 (Offered in evidence by complainant.)

Statement of Amounts Expended for Betterments to Plant Columbus Water Works Co., Columbus, Ga., for Years 1891, 1892, 1893, 1894, 1895, 1896, 1897, 1898, 1899, 1900, 1901, *up to* 1*st July*, 1902, *from Books of Company.*

1891.			
Dec.	31.	New Service pipe & connection	$700.36
"	"	New Meters & Meter Boxes	3,262.41
"	"	Purchase of 142 Acres Land—Stewart Spring Property	1,465.00
"	"	Extension of By-Basin at Reservoir	410.74
"	"	New Hydrants	651.65
"	"	New Mains	7,136.82
1892.			
Aug.	3.	Disct. on 15000 @ 7½	1,125.00
Dec.	31.	New Service pipes & connections	519.11
"	"	New Meters & Meter Boxes	1,502.81
"	"	New Mains	4,230.17
"	"	Preparing Maps & Survey Reservoir #3	461.30
"	"	New Machinery	1,052.23
1893.			
July	28.	Disct. on $6000 @ 20c	1,200.00
Aug.	10.	" " 1000 " 17½	175.00
"	17.	" " 2000 Bonds @ 15c	300.00
Dec.	31.	New Service pipe & connection	598.93
"	"	New Meter & Mater Boxes	313.77
"	"	New Hydrants	122.35
1894.			
M'ch	7.	Disct. on $7000 Bonds @ 7½	525.00
Dec.	31.	New Service pipe & connections	250.24
"	"	New Meter & Meter Boxes	278.15
"	31.	New Hydrants	46.15
"	"	New Mains	2,261.84

362

Dec.	31.	New Machinery	75.18
"	"	Submerged Main River	1,376.47
"	"	Extension to Broad St. Stand Pipe	790.95
"	"	Sand Trap upper reservoir	58.68
"	"	Improvement to Reservoir	125.45
1893.			
Dec.	31.	Land purchased from McElvey	5,270.00
"	"	New Mains	1,222.70
"	"	New Buildings	194.25
"	"	Submerged Main River	5,336.28
"	"	Stewart Spring Property	654.22
"	"	Engineering (surveys, Maps etc)	225.00
		Carried For'd	43,919.13

1895.			
Dec.	31.	New Service pipe & connections	300.56
"	"	New Meter & Meter Boxes	134.37
"	"	New Hydrants	56.87
"	"	New Valves & Valve Boxes	39.98
"	"	New Mains	260.69
"	"	New Buildings & Bridges	138.52
"	"	Submerged Mains	11.70
"	"	Improvements to Reservoir	2,408.04
1896.			
Jan'y	1.	Disct. 5000 Bonds @ 15c	750.00
Dec.	31.	New Service pipe & connections	263.99
"	"	New Meter & Meter Boxes	286.42
"	"	New Hydrants	65.65
"	"	New Valve & Valve Boxes	14.64
"	"	Lot Rose Hill for Stand Pipe	505.00
"	"	New Mains	125.51
"	"	Improvements to Reservoir	39.50
"	"	Rose Hill Stand Pipe	44.83
1897.			
Jan'y	1.	Disct. on $2000 Bonds 10c	200.00
"	"	" " $5000 " 10c	500.00
363			
Dec.	31.	New Service Pipe & connection	285.40
"	"	New Meter & Meter Boxes	715.22
"	"	New Hydrants	547.64
"	"	New Valves & Valve Boxes	117.31
"	"	Engineering, Surveys & Maps	49.00
"	"	New Mains	570.73
"	"	New Machinery	1.00
"	"	Submerged Main	3.80
"	"	Improvements to Reservoir	17.30
"	"	Rose Hill Stand Pipe	5,704.26
1898.			
Dec.	31.	New Service Pipe & Con	363.40
"	"	New Meter & Meter Boxes	615.82
"	"	New Hydrants	620.16
"	"	New Valves & Valve Boxes	520.45
"	"	Rose Hill Stand Pipe	48.35
"	"	Improvements to Reservoir	1.75
"	"	New Mains	10,346.32
"	"	New Buildings	43.49
"	"	New Machinery, Boiler &c	498.32
1899.			
Dec.	31.	New Service pipe & connections	565.98
"	"	New Meters & Meter Boxes	587.23
"	"	New Hydrants	21.50
"	"	New Valves & Valve Boxes	26.26
"	"	New Mains	4,137.86
"	"	New Machinery Power Pump part	1,439.87
"	"	Submerged Mains	168.90

1900.			
Feb'y	2.	Disct. on 2000 Bonds 10c	200.00
Ap'l	8.	" " 15000 " 12½c	1,875.00
Dec.	31.	New Service Pipe & Connections	610.09
"	"	New Meter & Meter Boxes	640.27
364			
Dec.	31.	New Hydrants	4.65
"	"	New Valves & Valve Boxes	222.38
"	"	New Mains	1,050.42
"	"	New Buildings	365.00
"	"	New Machinery Power Pump &c	1,039.93
"	"	Improvements to Reservoir	294.50
1901.			
Dec.	31.	New Service Pipes & connections	1,027.63
"	"	New Meter & Meter Boxes	499.44
"	"	New Hydrants	240.80
"	"	New Valves & Valve Boxes	7.10
"	"	New Mains	146.31
"	"	Labor Moving Hydrants for City	53.37
"	"	New Machinery	62.20
1902.			
July	1.	New Service Pipes & Connections	415.48
"	"	New Meters & Meter Boxes	744.03
"	"	New Valves & Valve Boxes	39.76
"	"	New Mains	9,594.77
"	"	New Machinery	32.28
"	"	Engineering J. W. Ledoux, Hydraulic	250.00
			94,489.13

CREDITS.

1891.				
Dec.	31.	Various small items	254.63	
1895.				
Dec.	31.	" " "	9.00	
1896.				
Dec.	31.	" " "	14.50	
1898.				
Dec.	31.	Charged to Property a/c by error 1895	1,226.10	
1900.				
Dec.	31.	Various small items	235.90	
				1,740.13
			(ERROR)*	$95,749.00
				*92,749.00

E. & O. E.

[* In pencil in copy.]

365 *Statement of Water Consumers of Cols. Water Works Co. for Years 1895, 1895, 1902, and Record of Amount of River Water Used During July, Aug., & Sept., 1903.*

(Called for by respondents.)

Office of Columbus Water Works Co.—W. S. Greene, Receiver.

COLUMBUS, GA., —— —, 190–.

No. Contracts	1 Jan., 1895	1,338
Actual Consumers	" " "	1,077
No. Contracts	1 Jan., 1898	1,447
Actual Consumers	" " "	1,173
No. Contracts	1 Jan., 1902	1,683
Actual Consumers	" " "	1,371

River Water used during months of July 1903, 1,977,289, Aug., 1903, 11,221,197, Sept. 1903, 9,233,920 as per record of Cols. R. R. Co. who furnished power to pump water from completion of Filters to Oct. 16th, 1903, water from Reservoirs to settling tanks passed over top of tanks down to bottom of same through 8" pipe. Since that date a larger tank with 12" pipe connected in bottom has been used.

G. T. P.

Increasing size of pipe to settling tanks giving a larger floe of water from Reservoirs thereby eliminating the necessity of using river water.

G. T. PREER.

366 (Called for by respondents and produced by witness W. S. Greene.)

Betterments to Plant of Columbus Water Works Company, W. S. Greene, Rec., to January, 1904.

New service pipe and meters	$881.93
New meters and meter boxes	624.29
New Hydrants	318.65
New valve and valve boxes	401.10
Filter plant and pumping station	33,903.28
Land purchased	6,411.75
New mains	2,648.57
New Machinery	73.12
Engineering	1,958.16
Total	$47,220.85

367 *Filter Plant Records.*

(Called for by respondents and produced by witness W. S. Greene.)

Office of Columbus Water Works Co., W. S. Greene, Receiver.

Date.	Wash water from filters, which, after washing, returns to river by sewer.	Total amount of water from river.	Total amount from reservoir.	Total amount of water supplied to city through filters.
1903.				
October.....	4,034,992	5,749,649	29,367,580	31,072,237
November...	2,682,432	946,835	29,081,951	27,346,354
December...	1,920,632	389,443	28,697,901	27,166,712
1904.				
January	1,251,000	680,637	28,709,639	28,139,276

The above figures are taken from records of filter plant and pumping station for month of October, November and December, 1903, and January, 1904. Said records are on file in my office.

The figures given below are from records of Columbus Railroad Company and are on file in their office:

	Total amount of water from river.
1903.	
July.....	1,977,289
August	11,221,197
September	9,233,920

W. S. GREENE, *Receiver.*

368 (Called for by respondents and produced by counsel for complainants.)

(*Extract of a Letter from Louis F. Garrard, Dated Columbus, Ga., March* 26, 1900, *Addressed to Messrs. Wilson, Colston & Co., P. O. Box* 1110, *Baltimore.*)

"The present condition of the company is very encouraging:

The total income for 1898 was.....	$29,302.61
" " " 1899 was.....	30,971.91
An increase of.....	$1,669.30

The earnings of 1899 are made up as follows:

City of Columbus, payable quarterly		8,198.13
Manufacturing enterprises, individual and corporations.		7,182.63
Private consumers, payable quarterly in advance		15,591.15
Total		$30,971.91
Operating expenses, 1899, including salaries, taxes, insurance, office rent and expenses		6,398.44
Net income for 1899		$24,573.47
Interest at five per cent on $370,000 of bonds		18,500.00
Profit and loss expended in improvements		6,073.47
Bonded indebtedness, March 26, 1900		400,000.00
Sold and outstanding	$371,000.00	
Held in treasury and hypothecated for money borrowed	29,000.00	
Bills payable	20,250.00	
		391,250.00
Surplus		$8,750.00"

369 (Called for by respondents and produced by counsel for complainants.)

Receipts and Disbursements, Columbus Water Works Co.

1900.

Interest on bonds ($386,000)	19,941.92	Water rents 32,991.35
Operating expenses	7,269.74	
Taxes, Georgia and Alabama	1,768.10	
Insurance Premiums	132.02	
Surplus earnings	3,879.57	
	32,991.35	32,991.35

Betterments.

New services	$610.09
" meters	640.27
" valves	222.38
" hydrants	4.65
" mains	1,235.02
" buildings	356.00
" new pump machinery	1,039.93
Improvements to reservoir	294.50
	$4,402.84

370 *Analysis of Reservoir Water.*

(Offered in evidence by respondents.)

State of Georgia, Department of Agriculture, Division of Chemistry.

Jno. M. McCandless, State Chemist.
R. G. Williams, Jos. Q. Burton, Ass't State Chemist-.
O. B. Stevens, Commissioner.
R. F. Wright, Ass't Commissioner.

ATLANTA, *July* 23, 1902.

Analysis 109.

Certificate of Analysis.

I find the sample of water received from Dr. W. L. Bullard, Columbus, Ga., to contain as below:

	Parts per million.	Grains per gallon.
Free Ammonia	0.288	0.0168
Albuminoid Ammonia	0.281	0.0163
"Required Oxygen"	4.09	0.2386
Nitrates	None	
Chlorine	1.80	0.1049
Total Solids	64.80	3.7800

The analytical figures show that this water is loaded with organic matter in a state of putrefaction, and is therefore unfit for drinking purposes.

Respectfully submitted,

JNO. M. McCANDLESS,
State Chemist.

371 *Affidavit of T. N. Kitchens with Analysis of John M. McCandless, State Chemist, Attached.*

(Offered in evidence by complainants.)

GEORGIA, *Muscogee County:*

Personally appeared Dr. T. N. Kitchens, who, being duly sworn, says, that just prior to September 3, 1903, deponent in company with W. S. Greene and W. T. McCormick took a sample of water from the clear water basin of the Columbus Water Works Co. in the condition that this water was being pumped into the mains of the Columbus Water Works Company. Deponent sealed this water in the presence of Major Greene and Mr. McCormick, and together

deponent and said parties took said water to the express office at Columbus, Ga., and delivered same to the express agent, directed to John M. McCandless, State Chemist.

The analysis of said John M. McCandliss, State Chemist, hereto attached is the certificate of the said Chemist as to the analysis of said water.

T. NEAL KITCHEN.

Sworn to and subscribed before me, this the 24th day of September, 1903.

W. CECIL NEILL, [SEAL.]
Notary Public, Muscogee County, Ga.

ATLANTA, GA., *Sept.* 3, 1903.

Certificate of Analysis.

I find the sample of water received from the Columbus Water Works Co. to contain as below:

	Parts per million.	Grains per gal.
Total Solids	45	2.6243
Chlorine	1.1	0.0641
Free Ammonia	0.01	0.0006
Albumin-ia	0.04	0.0023
Nitrogen as Nitrites	None	None
Nitrogen as Nitrate	Trace	Trace

The above analysis shows a very pure water, and one suited to all domestic and manufacturing uses.

Respectfully submitted,

JNO. M. McCANDLISS,
State Chemist.

372 *Analysis of John M. McCandless, State Chemist.*

State of Georgia, Department of Agriculture, Division of Chemistry.

ATLANTA, GA., *Sept.* 3, 1903.

Certificate of Analysis.

I find the sample of water received from Columbus Water Works Co. to contain as below:

	Parts per million.	Grains per gallon.
Total Solids	45	2.6243
Chlorine	1.1	0.0641
Free Ammonia	0.01	0.0006
Albuminoid Ammonia	0.04	0.0023
Nitrogen as Nitrites	None	None
Nitrogen as Nitrate	Trace	Trace

The above analysis shows a very pure water, and one suited to all domestic and manufacturing uses.

Respectfully submitted.

(Signed) JNO. M. McCANDLESS,
State Chemist.

373 (Offered in evidence by complainants.)

EXHIBIT "A" TO AFFIDAVIT OF F. M. COLSTON.

On this 9th day of September, 1903, appeared before me Walter N. Stromenger and Charles E. Riordan, to me well known, and testified under oath that they received from the Adams Express Company a case directed to F. M. Colston, from Columbus, Georgia, and that the said case was securely fastened and sealed when delivered to them, and that they took the said case, in the same condition in which they received it to Charles Glaser, analytical and consulting chemist, at his office at No. 21 South Gay Street, and delivered the said case to him intact.

WALTER N. STROMENGER.
CHARLES E. RIORDAN.

Sworn to and subscribed before me this 9th day of September, 1903.

Witness my hand and notarial seal.

[SEAL.] THOS. H. FITCHETT,
Notary Public.

Southern Brewers Station, Chemist to the Canned Goods Exchange of Baltimore City.

C. Glaser, Analytical and Consulting Chemist, Room 11, 21 S. Gay Street.

No. 19654.

BALTIMORE, *Sept.* 10, 1903.

374 *Analysis of C. Glaser of Reservoir Water.*

Certificate of Analysis of a sample of water, marked taken from reservoir 11 A. M. Sept. 7, 1903, Rec'd Sept. 9, 1903, from Messrs. Wilson, Colston & Co., for account of Columbus Water Works Co., Columbus, Ga.

Condition, clear, colorless, odorless. Reaction neutral.

One million parts contain:

Residue upon evaporation	70 parts
" " ignition	48 parts
Volatile and organic	22 "

Chlorine	3.75
Nitrogen as ammonia free	0.10
Ammonia Albuminoid	0.05
Nitric pentoxyde	0.8
" trioxyde	0.0
Oxygen absorbed	1.27
Carbon dioxyde, free, half free	17.60
Combined	6.60
In terms of calc. carbonate	15.0

Balance sulphate of calcium and magnesium and silica, iron faint trace.

Excellent water for all domestic purposes.

C. GLASER.

375 (Offered in evidence by complainants.)

EXHIBIT "B" TO AFFIDAVIT OF F. M. COLSTON.

On this 9th day of September, 1903, appeared before me Walter N. Stromenger and Charles E. Riordan, to me well known, and testified under oath that they received from the Adams Express Company a case directed to F. M. Colston, from Columbus, Georgia, and that said case was securely fastened and sealed when delivered to them, and that they took the said case, in the same condition in which they received it, to G. W. Lehmann & Son analytical chemists, at their office at No. 32 South Street, Baltimore, Maryland, and delivered the said case to them intact.

WALTER N. STROMENGER.
CHARLES E. RIORDAN.

Sworn and subscribed to before me this 9th day of September, 1903.

Witness my hand and notarial seal the day and year above written.

[SEAL.] THOS. H. FITCHETT,
Notary Public.

376 *Analysis of G. W. Lehmann & Son of Reservoir Water.*

(Offered in evidence by complainants.)

EXHIBIT "B."

G. G. Lehmann, Chemist, City Health Department, and U. S. Government.

Leslie P. Lehmann, Analytical Chemist.

G. W. Lehmann & Son, 32 South Street, Chemists and Bacteriologists.

Analysis No. 28,321.

Sample of (Sealed) Water.

Marked taken from reservoir of Columbus, W. W. Co., Baltimore, September 12, 1903. From Columbus Water Works Co., 11 A. M., Sept. 7, 1903. Received September 9, 1903.

Constituents.	Figures in parts per million.	Remarks.
Color	Clear	
Odor	None	
Reaction	Neutral	
Matter in suspension	0.00	
Total residue at 230° F.	82	
Volatile Residue	22	
Ignited residue	60	
Amount of Chlorine	2.41	
" Nitrogen as free Ammonia	0.04	
" Albuminoid Ammonia	0.12	
" Nitrates	0.62	
377 Amount of nitrites	0.00	
" Sulphates calculated as SO_3	1.27	
Required Oxygen	0.82	
Hardness	24.69	
Character of Water	Good.	

Good drinking water should be clear and colorless, without odor and neutral in reaction.

The "total residue" should not exceed 500 parts per million.

The "Ignited Residue" may constitute the total residue.

The smaller the amount of "Volatile Residue" the better.

The amount of "Nitrogen" as "Free Ammonia" should not exceed .05 parts per million.

The amount of "Nitrogen as Albuminoid Ammonia" should not exceed .15 parts per million.

The amount of "Nitrogen as Nitrates" should not exceed 5.00 parts per million.

There should be no "Nitrites" present, as they indicate active decomposition of organic matter.

The amount of "Earthy Bases" should not exceed 200.00 parts per million.

The amount of "Sulphates" should not exceed 100.00 parts per million.

Good, potable water; absolutely free from animal organic pollution.

G. H. LEHMANN & SON. [SEAL.]

378 *Letter of Frederick M. Colston et al. to Mayor & City Council of Columbus.*

(Introduced in evidence by complainants.)

EXHIBIT "C" TO AFFIDAVIT OF F. M. COLSTON.

(Copy.)

COLUMBUS, GA., *Feb.* 14, 1903.

To the Mayor and City Council of Columbus, Ga.

GENTLEMEN: As representatives of the holders of bonds of the Columbus Water Works Co., we have ordered machinery which will be at once installed and which will provide sufficient pressure to the water in all parts of the city, for all purposes.

We are also about to order the necessary machinery and works to supply all water needed for a much larger population than at present at Columbus.

As we understand that the city government desires municipal ownership of the water works and we are aware under the present contract between the city and the water works company, the city has the right after 12 months' notice, to purchase the works of the water company, we offer in behalf of the bondholders and receiver of said company to waive the 12 months' notice and have the arbitrators appointed at once, in the manner provided in the contract, provided your honorable body notifies us on or before March 10th, next, of your intention to purchase the property of the water works company.

Should you not accept of this offer we shall undertake and push to completion the increase of the works, and any purchase
379 hereafter would necessarily include the new works about to be undertaken.

It is manifestly not to the interest of the city to have two competing water works, and we are confident that the present income of the company will enable the city to secure its water works cheaper than it can obtain them in any other way.

Very respectfully,

(Signed) FREDERICK M. COLSTON.
JULIAN T. BURKE.
MILES WHITE, JR.

380 *Certificate of Result of Bond Election Held Dec. 4/02.*

(Introduced in evidence by respondents.)

December 4, 1902.—The undersigned managers of said special election do hereby certify that we opened separate polls for white and colored voters at the Court House in said City of Columbus, at 6 o'clock, A. M., this the 4th day of December, 1902. * * * and that there were cast at said election votes as follows:

For Water Bonds: 1349 white votes and 291 colored votes. Total: 1640. Against water works bonds: 6 white votes and one colored vote. Total 7."

* * * * * * *

I hereby certify that the above are true extracts from the minutes of council of the date mentioned.

This Feb'y 26, 1904.

M. M. MOORE,
Clerk of Council, City of Columbus, Ga.

381 STATE OF GEORGIA,
Muscogee County:

In person appeared before the undersigned, Ed. Wohlwender, who being duly sworn, deposes and says, that he has examined the records of the Proceedings of the City Council of Columbus, Georgia, and that the following are extracts from the Proceedings of said City Council on September 1st, 1886, October 6th, 1886, March 2nd, 1887, April 6th, 1887, February 1st, 1888, June 6th, 1888, February 5th, 1890, to be found on pages 170, 175, 214-17, 223, 284, 314, and 461 of Book "I" of said Records; on March 1st, 1893, April 5th, 1893, April 13th, 1893, May 2nd, 1894, July 5th, 1894, September 10th, 1894, October 3rd, 1894, November 26th, 1894, December 27th, 1894, January 2nd, 1895, to be found of pages 197, 198, 209, 212, 213, 373, 374, 375, 398, 399, 400, 401? 402, 438, 439, 440, 441, 442, 449, 451, 452, 466, 467, 509, 510, 516, 517, 518 of Book "J" of said Records; on November 27th, 1895, December 4th, 1895, January 1st, 1896, March 4th, 1896, April 1st, 1896, to be found on pages 79, 84, 87, 88, 89, 126, 145, 146, 147, 170, 171, 172, 173 of Book "K" of said Records; on July 16th, 1902, and August 6th, 1902, to be found on pages 109, 110, 111, 119, 120 of Book "M" of said Records.

382 *Extracts of Minutes City Council of Columbus, Ga.*

(Beginning here and running down to page 391 of this record was introduced in evidence by respondents.)

SEPTEMBER 1ST, 1886.

Alderman McEachern of Water Works Committee, submitted the following which was approved by alderman Jefferson and Foley and made the report of the committee.

On account of the insufficient supply of water and the very unwholesome quality of such as we get from the Columbus Water Works, I hereby move that we at once call the attention of said Company to Section 10, 11, and 13 of the contract, and that in conformity with section 13 we appoint an expert at this meeting and notify the Water Works Co. of our action, and for them to do the same at once.

Adopted.

OCTOBER 6TH, 1886.

Alderman McEachern of Committee on Water Works, stated that Mr. Archer, President of Water Works Company, was in the City and in a conference with the committee, expressed his intention to at once endeavor to correct the evils complained of in regard to the Water Works system.

COLUMBUS, GA., *Mar.* 2, 1887.

Sam'l B. Hatcher, Esq., City Attorney.

DEAR SIR: The undersigned committee on cisterns, Fire Department and Water Works of City Council, beg to submit to you for your opinion the following facts:

1st. The water supply of the City is deficient in quantity
383 and quality. On the occasion of a fire on 4th Avenue, between 10th and 11th Streets, a short time since, the pressure was not sufficient to throw a stream of water on a one-story kitchen. Again, when Mr. Willcox's house burned, a few months since, the pressure was insufficient, and the City Fire Department have made frequent complaints on this score and justly as we think.

2nd. Complaints are made that the water is muddy and not properly filtered and unwholesome—portions of the flesh of a dead goat having passed through the pipes on one occasion we are informed, and other complaints of the unwholesomeness of the water are made. Now this committee recognizing the justice of said complaints, as well as the insecurity of property in the event of a fire, we beg to ask your opinion of the rights of the City under her contract with the Water Works Co. We submit this for your opinion hoping that you will investigate the terms of the contract, and that we may do no injustice to the Water Works Co. at the same time desiring to know the full rights of the City, feeling that she is paying well for all the benefits she may be entitled to under said contract, and with the knowledge that the water supply is now insufficient, due doubtless to the great increase of private consumption and the smallness of the pipe.

Also please advise us of the remedy to be adopted by the City in the event that the Water Works Co. should fail or refuse to
384 comply with this contract within a reasonable time.

Very respectfully,

THEO. M. FOLEY,
E. S. McEACHERN,
J. S. GARRETT,

Com.

Opinion.

In re Water Works Company Contract with the City of Columbus.

To Mess. Foley, Garrett, and McEachern, Com. on Fire Dept.

GENTLEMEN: Your letter of 2nd inst. asking my opinion as to the rights of the city of Columbus under the contract with the Water Works Co. of date Oct. 7th, 1881, to hand and noted. The particulars enquired of I will proceed to answer seriatum:

1st. The insufficiency of the water supply and the danger to the City in the event of a fire. This defect is of vital importance and is the main element of consideration in the contract moving to the city in her corporate capacity; and as you suggest "that she is paying well for all the benefits she may be entitled to under said contract" it is opportune to examine as to her rights—for upon the facts stated, the city is not receiving a "*Quid pro quo*" for the large sums she contracts to pay under said contract, whether said contract is a legal and constitutional obligation is not before me.

Section 4 of the contract provides, "a water supply main,
385 &c. of ample capacity for water supply; which in the beginning shall be of 12 inches internal diameter."

Section 5 of the contract provides: "The distribution system in the city shall, in the beginning, consist &c." reference being had to such a mode of distribution as shall give the greatest amount of fire protection to the city.

Section 9 of the contract provides: The sizes of street mains shall be ample for supply to consumers and for fire protection &c."

Section 10 of the contract provides: "The supply of water both in quality and amount, shall be wholesome, constant and amply sufficient to meet the wants of the city and private consumption, for future and present requirements."

Section 27 of the contract provides: Whenever the consumption of water on the line of any street main is so great as to reduce the pressure between the hours of 9 and 10 o'clock A. M. and 1 and 2 o'clock P. M., below 32 pounds to the square inch, said water main shall be deemed of insufficient capacity and shall be replaced &c. to give the pressure above named."

The above are the sections of the contract bearing on the subject of "amount of water" and when sufficient. If the supply is insufficient after proper tests are made, as provided in section 27, then the Water Works Co. are not complying with the terms of their contract.

386 2nd. In regard to the water not being properly filtered, muddy and unwhol-some. The contract provides that the water shall be filtered and whol-some, and section 13 provides "should the water supply ever become contaminated or unwhol'-some, from any cause, upon notice being given by the proper city authorities," the company agrees to make all provisions practicable for improving the quality; and if, at any reasonable time, after such

1902.

		9 to 10 A. M.	1 to 2 P. M.
May	28	25 #	24 #
"	29	24 #	25 #
"	30	25 #	25 #
"	31	23 #	24 #
466			
June	1	29 #	
"	2	28 #	28 #
"	3	28 #	28 #
"	4	23 #	24 #
"	9		31 #
"	10	31 #	30 #
"	11	30 #	30 #
"	12	27 #	28 #
"	13	30 #	
"	16	30 #	31 #
"	17	31 #	29 #
"	18	26 #	26 #
"	23		31 #
"	29	29 #	29 #
"	30	27 #	28 #
July	1	15 #	19 #
"	2	18 #	18 #
"	3	24 #	
"	4	19 #	19 #
"	5	25 #	28 #
"	7	29 #	26 #
"	8	22 #	21 #
"	9	23 #	20 #
"	10	19 #	20 #
"	11	19 #	
"	12		29 #
"	14	23 #	20 #
"	15	26 #	28 #
"	17	28 #	29 #
"	18	20 #	23 #
"	19	27 #	22 #
"	20	27 #	
"	21	30 #	
"	22	20 #	24 #
"	23	25 #	28 #
"	24	20 #	
"	25	26 #	
"	26	26 #	
"	29		23 #
"	30	27 #	30 #
"	31	22 #	27 #

1902.

		9 to 10 A. M.	1 to 2 P. M.
Aug.	1	24 #	28 #
"	2	23 #	22 #
"	3	28 #	27 #
"	4	29 #	30 #
"	5	23 #	23 #
"	17		23 #
"	20		24 #
"	21	20 #	18 #
"	27	30 #	28 #
Sept.	3	30 #	
"	13	30 #	
"	15	20 #	
"	17	15 #	20 #
"	18	29 #	
"	19	27 #	28 #
"	20	27 #	
"	25	20 #	
"	26		31 #

467

Oct.	2	30 #	30 #
"	3	30 #	29 #
"	4	30 #	30 #
"	15		31 #
"	22		30 #
"	23		30 #
"	24	30 #	30 #
"	25		30 #
"	27	27 #	28 #
"	31	31 #	29 #
Nov.	3	28 #	27 #
"	4		31 #
"	6		30 #
"	7	30 #	30 #
"	8	31 #	30 #
"	10	31 #	29 #
"	12		30 #
"	13	30 #	29 #
"	14	29 #	26 #
"	15	30 #	
"	16	29 #	
"	17	30 #	29 #
"	18	31 #	29 #
"	19	31 #	30 #
"	20	30 #	28 #
"	21	29 #	28 #
"	22	30 #	28 #

1892.

		9 to 10 A. M.	1 to 2 P. M.
Nov.	24		28 #
"	25	30 #	30 #
"	26	30 #	28 #
"	27	30 #	
"	28	31 #	31 #
"	29	30 #	29 #
Dec.	2		24 #
"	3	19 #	22 #
"	4	20 #	22 #
"	5	24 #	27 #
"	6	21 #	25 #
"	7	22 #	16 #
"	8	26 #	26 #
"	9	15 #	21 #
"	10	19 #	19 #
"	18		29 #
"	19	16 #	25 #
"	20	20 #	25 #
"	21	29 #	26 #
"	22	24 #	29 #
"	23	22 #	28 #
"	24	19 #	29 #
"	25	28 #	21 #
"	26		22 #

GEORGIA, *Muscogee County:*

Personally appeared before me, R. S. King and G. T. Preer, who being duly sworn, say that the foregoing is a true copy from the records of the water pressure taken from gauge at No. 5
468 Engine House for the dates and hours as stated therein.

R. S. KING.
G. T. PREER.

Sworn to and subscribed before me, this 10 March, 1904.

N. A. BROWN,
U. S. Commissioner.

469 *Pressure Records Kept by Chief Eng'r of Fire Department.*

(Introduced in evidence by respondents.)

The following is a record of Water Pressure on mains of Columbus Water Works Company, kept by Chief of Fire Department, Columbus, Ga., (page 41 of daily report book of said Chief of Fire Department).

"June 24, 1902. Owing to low pressure reported from engine houses No. 1 and No. 5, and complaint from takers on Rose Hill, I

was ordered by his Honor, the Mayor, to take the pressure at the Rose Hill Stand pipe twice a day 'till July 2nd. The following is the result:

June 24. 6.50 P. M., 25 lbs.
25th. 8.55 A. M., 30 lbs. 5.55 P. M. 25 lbs.
26th. 8.30 A. M. 25 lbs. 6.23 P. M. 16 lbs.
27th. 9.00 A. M. 23 lbs. 6.22 15 lbs.
28th. 9.05 A. M. 20 lbs. 6.40 P. M., 13 lbs.
29th. 8.27 A. M., 21 lbs. 5.42 P. M., 30 lbs.
30th. 8.52 A. M., 45 lbs. 6.16 P. M., 18 lbs.
July 1st. 10.20 A. M., 45 lbs. 5.40 P. M., 40 lbs.
2nd. 9.10 A. M., 50 lbs.

All of the tests were made at the corner of 21st Street and Hamilton Avenue, and reported to Mayor Chappell in writing July 2nd.

Record of water pressure at No. 1 Engine House on date and hour mentioned.

June	6 A. M.	9 A. M.	12 M.	3 P. M.	6 P. M.	9 P. M.	Avg.
18th	80	80	75	70	65		75
19th	85	55	50	50	30		54
20th	55	45	30	50	40	50	45
21st	60	55	50	40	45	60	51¾
22nd ...	80 V. C.	75	75	70	65	70	72½
470							
23	85	80	75	65	60	55	70
24	80	80 V. O.	60	50	45	50	60 5/6
25	55	50	55	50	35	40	47½
26	50	35	40	35	25	40	37½
27	50	45	40	40	20	35	38¼
28	40	35	30	30	30	40	34 1/6
29	50	50	45	60	65	65	55 5/6
30	75	75	60	55	45	55	60 5/6
July							
1	70	75	70	70	65	70	70
2	75	70	75	25 V. O.	65 V. C.	60	61 2/3
3	80	85	70	65	60	60	70
4	65	65	65	65	70	70	66⅔
5	65	80	80	80	80	80	77½
6	80	75	70	65	70	70	71¾
7	80	70	70	65	60	60	67½
8	80	60	80	75	70	70	72½
9	75	70	75	70	60	50	66⅔
10	70	60	60	50	50	40	55
11	80	70	45 V. O.	70 V. C.	75	80	70

V. O. Valve opened.
V. C. Valve closed.

471 *Extracts from Minutes of Board of Health of City of Columbus, Ga., Introduced in Evidence by Respondents.*

JULY 14TH, 1902.

Called Meeting.

Board met at 3 o'clock P. M. pursuant to a call of the President. Present, Dr. Bullard, President, Messrs. Gautier, McDuffie, Simms and Ticknor.

The minutes of the last meeting were read and approved—previous to this however, the members took and subscribed to the oath of office before Mayor Chappell.

The President said that it was a proper occasion for the reorganization of the Board—the old Board having been selected by Council on 2nd inst.

On motion of Dr. Ticknor, Dr. Bullard was nominated and re-elected President for the ensuing year.

Upon inquiry by the Mayor each member said that he had under treatment one or more cases of fever, some of it typhoid, and that some of the patients used hydrant and other well water.

On motion of Dr. McDuffie it was resolved that "it is the sense of this body that it will uphold the city council in any step it may take to procure more and better water for use of citizens."

A motion of Dr. Gautier, Council was requested to adopt any ordinance requiring the occasional inspection by some proper official, of milk sold in the city, and also the source of water supply
472 to cattle furnishing such milk.

On motion of Dr. McDuffie the Council was requested to authorize the President of this Board to have analyzed by the State Chemist the water being furnished by the Water Works Company.

It was agreed that regular meeting of the Board be held on Tuesday before the first Wednesday in each month at 3 P. M.

The Board then adjourned.

M. M. MOORE, *Sec'y.*

JULY 24TH, 1902.

Called Meeting.

Board met at 12 o'clock M. pursuant to call of the President. Present, Dr. W. L. Bullard, President, and a full Board excepting Drs. Mitchell & Ticknor.

The President submitted the following communication from the State Chemist:

ATLANTA, *July* 23, 1902.

Certificate of Analysis.

I find the sample of water received from Dr. W. L. Bullard, Columbus, Ga. to contain as below:

	Parts per million.	Grains per gal.
Free Ammonia	0.288	0.0168
Albuminoid Ammonia	0.281	0.0163
Required Oxygen	4.09	0.2386
Nitrates	None.	None.
Chlorine	1.80	0.1049
Total solids	64.80	3.7800

473 The analytical figures show that this water is loaded with organic matter in a State of putrifaction and is therefore, unfit for drinking purposes.

Respectfully submitted,

JOHN M. McCANDLESS,
State Chemist.

Dr. Blanchard offered the following resolutions which were adopted.

"Whereas, In the opinion of this Board, from a personal inspection of the source of water supply of the Columbus Water Works Company in Alabama, and after an analysis by the State Chemist of the water now being supplied to this city, such water is unwholesome and unfit to drink: therefore,

Resolved, that we recommend to our citizens to discontinue the use of the water now furnished by the Columbus Water Works Company from Holland Creek.

Resolved further, that in our opinion the use of river water taken from some point above the Bibb Mill would be preferable.

Dr. McDuffie moved that a committee of three be appointed to consider the advisability of getting supply of water from the river near the city mills. Adopted, and the President appointed Drs McDuffie, Simms and Blanchard, as said committee.

The Board then adjourned.

M. M. MOORE, *Sec'y.*

474 AUG. 1ST, 1902.

Called meeting.

Board met at 12 o'clock M. pursuant to call of the President.

Present: Dr. Bullard, Prest. and a full Board excepting Messrs. Mitchell and Ticknor.

The special committee appointed at last meeting made the following report, which was received.

To Board of Health of City of Columbus, Ga.:

The undersigned, recently appointed as a special committee to investigate the advisability of using the Chattahoochee river water

for drinking purposes, beg to submit the following report: We have had an analysis made, by a competent Chemist (Mr. H. M. Hicks) of this city, of the sample of the river water obtained by us at the present pumping station at the Columbus Railroad Company's power plant—said analysis is hereto attached:

This analysis shows that if this water was filtered, it would be wholesome drinking water except for a very small percentage of albuminoid Ammonia which it contains. As we are not positively sure whether this ingredient originates from animal or vegetable decomposition and as there is a possibility of this contamination resulting from the sewerage of the Bibb City property and Columbus Mfg. Co. and Rose Hill, we cannot advise the use of this water for drinking purposes, although as compared with our present supply, we deem the river water by far "the lesser of the two evils."

We herewith append a résumé of the opinion of the best
475 authorities as to what good drinking water should, or should not contain.

Chlorides—parts per 100,000	.....	.06 to 2.39 allowable
Phosphates "	.....	None
Nitrites "	.....	None
Nitrogen in Nitrates "	.....	.01 to .02 allowable
Free Ammonia "	.....	.001 to .003 "
Albuminoid Ammonia "	.....	.016 to .02 "

By a comparison of the above with the analysis made of the Reservoir and River water, a correct idea can be obtained of the relative value of each as drinking water.

Respectfully submitted,

J. M. McDUFFIE,
EDWIN H. SIMMS,
M. D. BLANCHARD,
Committee.

July 31, 1902.

Analysis.

COLUMBUS, GA., 7/29, 1902.

Drs. McDuffie, Blanchard and Simms, City.

GENTLEMEN: From the sample of Chattahoochee River water submitted to me for analysis, I find as follows.

Nature	Sanitary.
Color	Reddish Brown
Odor (100° F.)	Very Slight
Chlorines in Chlorides	0.46696
Equivalent in Sodium Chloride	0.2830
Phosphates	None
Nitrogen in Nitrates & Nitrites	0.0200
Nitrites	Trace
476 Free Ammonia	0.0050
Albuminoid Ammonia	0.0150

Temp. Hardness	7.0000
Mud & Mineral matter	19.1000
Organic & Veg. matter	5.8000
Total Solids	24.9000

Yours respectfully,

H. M. HICKS, *Ph. G.*

The Board then adjourned.

F. V. SCHLEY,
Sec'y Pro tem.

477 *Extracts from Book of Minutes of the Columbus Water Works Company, Introduced in Evidence by Respondents.*

Office of the Columbus Water Wks. Co.

COLUMBUS, GA., *Feb'y* 11, 1891.

A called meeting of the Directors of the Columbus Water Works Co. was this day held. The following Directors were present, to-wit: H. H. Epping, John Hill and Louis F. Garrard.

On motion of Mr. John Hill, which was duly seconded by Mr. L. F. Garrard, it was unanimously resolved that Theo. M. Foley be elected a Director to fill the vacancy caused by Mr. Synnott having sold his stock, and having resigned his position as Director: Mr. Foley being present, took part in the meeting.

President Epping submitted the following report:

On the Twenty Sixth day of January, 1891, I sold Three Hundred and Twenty Five Thousand dollars ($325,000) of the new first mortgage bonds of the Company to a syndicate in Baltimore represented by Wilson, Colston & Company, in accordance with the authority given by the stockholders at their meeting of Dec. 3rd, 1890, together with Two Hundred (200) shares of the Capital stock of the Company in the treasury, all for the sum of Two Hundred and Ninety Two Thousand Five hundred dollars ($292,500), the interest of which amounts to 864.75; Total $293,364.75/100.

478 Which amount has been applied for the purposes of the company as follows:

For retiring the bonds bearing date November 1st, 1888, the total of which was $150,000	$150,000	
For satisfying various indebtedness of the company for construction and the purchase of property, and advances for the purpose by present and former stockholders	128,565	
For sundry expenses in connection with the preparation of new bonds and the sale of same	1,705	
The remainder has been placed in treasury of the company.	13,094	75/100
Total	$293,364	75/100

The 200 shares of the capital stock of the company above referred to, have been issued to,

H. H. Epping	17 shares.
H. H. Epping	33 "
L. F. Garrard	50 "
T. M. Foley	50 "
S. Spencer	50 "

in accordance with the instructions of the purchasing syndicate.

All of which is respectfully submitted for the approval of the Board.

On motion of Mr. Garrard, and seconded by Mr. Foley, it was unanimously resolved that the report of the President be accepted, and his action is hereby approved and ratified.

The resignation of Mr. Townsend as Secretary and Treasurer, was received, and on motion of Mr. Foley, the same was accepted.

479 There being a vacancy in the office of Secretary, and also the office of Treasurer, the name of Mr. James G. Beasley was placed in nomination by the President for the office of Secretary, and also the office of Treasurer, which nomination was seconded by Mr. Garrard, and Mr. Beasley was unanimously elected to fill the unexpired term of Mr. Townsend as Secretary and also as Treasurer of the Columbus Water Works Co.

On motion of Mr. Garrard the meeting then adjourned.

H. H. EPPING, *Pres't.*
J. G. BEASLEY, *Sec'y.*

Office of the Columbus Water Wks. Co.

COLUMBUS, GA., *Feb'y 12th,* 1891.

The annual meeting of the Stock Holders of the Columbus Water Wks. Co. was held this day at the office of the company in Columbus, Georgia.

On motion of Mr. H. H. Epping, Mr. L. F. Garrard was unanimously elected chairman of the Stock Holders meeting, and on motion of Mr. John F. Flournoy, seconded by Mr. Theo. Foley, Mr. Jas. G. Beasley was requested to act as Secretary of the Stock-holders meeting.

On motion of Mr. John F. Flournoy the chairman appointed a committee of three, consisting of Mr. John F. Flournoy, Mr. Early H. Epping and Mr. Theo. M. Foley, to examine proxies, and to ascertain what amount of stock was present, either in person

480 or by proxy, and report the same to the meeting.

The committee through their chairman, Mr. John F. Flournoy reported the following Stock Holders as present in person and by proxy:

H. H. Epping	600 Shares.
L. F. Garrard	650 "
T. M. Foley	650 "
S. S. Spencer, By L. F. Garrard, Att'y in fact	50 "
W. S. Townsend, By L. F. Garrard, Att'y in fact	600 "

E. H. Epping	300	Shares.
J. F. Flournoy	75	"
H. H. Epping, Jr.	75	"
	3000	Shares.

On motion of Mr. Foley, seconded by Mr. Henry Epping the President's report, as made to the Directors of this company on February 11th, 1891, and which is set forth in full on pages 3 and 4 of these minutes was read and laid before this Stock Holders' meeting.

After considering said report it was unanimously resolved by a Stock vote, that the report of the President be accepted, and his action is hereby approved and ratified by the vote of all the Stock Holders of said company, they being present in person or by duly authorized power of attorney and being in the affirmative, making a total vote of Three Thousand shares cast in favor of the adoption, ratification and approval of said report.

Mr. John F. Flournoy then placed in nomination the fol-
481 lowing Board of Directors for the ensuing year, to-wit:

Louis F. Garrard, H. H. Epping, Theo. M. Foley, Samuel Spencer and Early H. Epping, and all of said board of Directors were unanimously elected by ballot, Stock Holders voting by Stock, and voting Three Thousand shares of stock in favor of the election of said Board.

The power of Attorney made by Samuel Spencer and W. S. Townsend to Louis F. Garrard, to vote their stock at this meeting having been approved of by this meeting, were ordered filed by the Secretary.

On motion of Theo. M. Foley, the meeting then adjourned.

LOUIS F. GARRARD, *Chairman.*
J. G. BEASLEY, *Sec'ty.*

482 *Charter of Columbus Water Works Co.*

"Introduced in Evidence by Complainants."

In re THOMAS R. WHITE ET AL.

Petition for Incorporation of "The Columbus Water Works Company."

The petition for incorporation filed in the above stated case having been duly considered and it being made to appear that the objects of said corporation are such as authorized the Superior Court to grant a Charter therefor; and it being made further to appear that the publication of said petition has been made in the Daily-Enquirer-Sun, a newspaper published in the City of Columbus, Ga., as is prescribed by law.

It is considered and adjudged that the said Thomas R. White and Frank B. Lefferts and B. H. Hudson with such other persons as may be associated with them be and they are hereby incorporated and made a body politic and corporate for the term of twenty years from this day under the name and style of "The Columbus Water Works

Company" and with the privileges of renewal at the expiration of that time; with power to contract and be contracted with; to sue and be sued, to have, hold, use and enjoy such real and personal property as they may require in their said business and as may be needful and necessary for the purposes of the business, to issue certificates of stock upon a capital stock of seventy five thousand dollars with the privilege of increasing the same to the sum of one hun-
483 dred and fifty thousand dollars in shares of fifty dollars each and to make assessments and raise money and supply material and means for the prosecution of said enterprise from stockholders in said company and others, and to give and receive mortgages and to issue bonds of said company in such manner and sums as may be necessary; to have and to use a common seal; to make and adopt and amend and alter such a constitution and by-laws and regulations consistent with the laws of this State and necessary and proper, in the management of the business; and to appoint and select all officers and agents necessary for the transaction of said business, with such other powers and privileges consistant with law and that will promote the object and purposes of said association.

Ordered and allowed by the Court this 24th day of November, 1881.

(Signed) J. T. WILLIS.
Judge, S. C., C. C.

GEORGIA, *Muscogee County:*

Petition for the Incorporation "The Columbus Water Works Company."

To the Honorable the Superior Court of said County:

The petition of Thomas R. White and Frank B. Lefferts and B. H. Hudson, respectfully shows; That they have associated themselves together for the purpose of organizing, contracting and
484 operating an effective system of Water Works to supply the city and citizens of Columbus with water for domestic, manufacturing and sanitary purposes; and for the better protection of the city from the ravages of fire; and desire, together with such other persons as may hereafter be associated with them to be incorporated under the name and style of the "Columbus Water Works Company." That they desire to be incorporated for the term of twenty years, with the privilege of renewal at the expiration of that time; and the place of business to be in Columbus, in said County and State.

Your petitioners further show that they propose to have a capital stock of seventy-five thousand dollars with the privilege of increasing the same to one hundred and fifty thousand dollars, in shares of fifty dollars each, said capital stock to be raised, collected and paid in by assessments on each share or in such manner as may hereafter be prescribed by them and is customary in such associations.

Your petitioners further show that such being their object they pray an order to be passed by your honorable court incorporating

them and such other persons as may be associated with them, under the name and style aforesaid, with power to contract and be contracted with; to sue and be sued; to purchase and hold property and convey the same, and hold use and enjoy the same, for the purpose of their association and whenever necessary to issue bonds in such manner as may hereafter be prescribed; to have and
485 use a common seal; and with power further to make, alter and amend such a constitution, by-laws, rules, regulations, etc., as may be consistent with the laws of this state, and in their judgment necessary and proper in the management of their business; to elect or appoint such officers and agents for the transaction of said business as may be necessary, and have such other powers and privileges consistent with law as will promote the object and business of said association.

And your petitioners will ever pray, etc.

(Signed) W. F. WILLIAMS,
B. H. CRAWFORD,
Att'ys for Petitioners.

GEORGIA, *Muscogee County:*

Filed in the Clerk's office of the Superior Court of said County, this 24th day of October, 1881.

GEO. Y. POND,
Clerk of Superior Court, Muscogee Co., Ga.

(Once a week for four weeks.)

Compl't also offered Aug. 4, 1904 (*nunc pro tunc*) by permission of Master petition & order of amendment & renewal of charter, amendment allowing maximum capital stock to $210,800 and charter renewed for 20 yrs. from date — expiration of charter Nov. 24, 1881. Petition for amendment & renewal filed in Muscogee Superior C'rt May 10, 1899 & order allowing amendment & renewal granted June 15th, 1899.

(Identified) H. R. GOETCHIUS, *Master.*

Aug. 4, 1904.

486 *Charter of Columbus Water Works Co.*

"Introduced in Evidence by Complainants."

GEORGIA, *Muscogee County:*

Petition for the Incorporation of The Columbus Water Works Company.

To the Honorable the Superior Court of said County:

The petition of Thomas R. White and Frank B. Lefferts and B. H. Hudson respectfully shows that they have associated themselves together for the purpose of organizing, constructing and operating an effective system of Water Works, to supply the City and citizens of Columbus with water for domestic, manufacturing and sanitary

purposes, and for the better protection of the City from the ravages of fire, and desire, together with such other persons, as may hereafter be associated with them to be incorporated under the name and style of the "Columbus Water Works Company," that they desire to be incorporated for the term of twenty years, with the privilege of renewal at the expiration of that time, and the place of business to be in Columbus, in said County and State.

Your petitioners further show that they propose to have a capital stock of seventy five thousand dollars, with the privilege of increasing the same to one hundred and fifty thousand dollars, in shares of fifty dollars each, said capital stock to be raised collected and paid in by assessments, on each share, or in such manner, as may hereafter be prescribed by them and is customary in such associations.

Your petitioners further show that such being their object
487 they pray an order to be passed by your Honorable Court, incorporating them, and such other persons, as may be associated with them, under the name and style aforesaid, with power to contract and be contracted with; to sue and be sued; to purchase and hold property and convey the same and hold use and enjoy the same for the purposes of their association; and when ever necessary to issue bonds in such manner, as may hereafter be prescribed; to have and use a common seal; and with power further to make, alter and amend such a constitution, by-laws, rules regulations, &c., as may be consistent with the laws of this State, and in their judgment, necessary and proper in the management of their business; to elect or appoint such officers and agents, for the transaction of said business, as may be necessary, and have such other powers and privileges, consistent with law, as will promote the objects and business of said association.

And your petitioners will ever pray, etc.

W. F. WILLIAMS,
B. H. CRAWFORD,
Att'ys for Petitioners.

Filed in office of the Clerk of the Superior Court of Muscogee County, Georgia, on the 24th day of October, 1881.

488 *In Re* THOMAS R. WHITE ET AL.

Petition for Incorporation of "The Columbus Water Works Company."

The petition for incorporation filed in the above stated case having been duly considered, and it being made to appear that the objects of said incorporation are such as authorized the Superior Court to grant a charter therefor; and it being made further to appear that the publication of said petition has been made in the Daily-Enquirer-Sun, a newspaper published in the City of Columbus, Ga. as is prescribed by law.

It is considered and adjudged that the said Thomas R. White and Frank B. Lefferts and B. H. Hudson with such other persons as may be associated with them be and they are hereby incorporated and

made a body politic and corporate, for the term of twenty years, from this day, under the name and style of "The Columbus Water Works Company," and with the privilege of renewal at the expiration of that time, with power to contract, and be contracted with, to sue and be sued, to have, hold, use and enjoy such real and personal property as they may acquire in their said business, and as may be needful and necessary for the purposes of the business, to issue certificates of stock, upon a capital stock of seventy five thousand dollars, with the privilege of increasing the same to the sum of one hundred and fifty thousand dollars, in shares of fifty dollars each, and to make assessments and raise money and supply material and means for the prosecution of said enterprise from stockholders

488½ *Note by the Master.*

As part of the record of testimony in the cause and directed by the master to be incorporated therein & considered in the trial of the cause is to be also considered testimony taken before his Honor Judge Wm. T. Newman June 25*rd* 1904 on motion to dissolve temporary injunction—This testimony is of file July 11/904 & properly identified by the master & consists of 25 pages of typewritten matter—

The witnesses on behalf of movant in the petition to dissolve—being the city of Columbus were—W. S. Greene and his report filed June 25/904 in No. 57 in Equity & T. H. Chappell and for respondent in the motion (the trustee) was A. E. Boardman—

Also on Aug. 10/904 the master permitted to be filed as part of the record of testimony, affidavit of W. S. Greene referring to analyses of Chattahoochee River water—& entry of order is therein entered permitting filing of same—of this evidence—Exhibit A is offered on part of City of Columbus & Exhibits B, C, D & E by complainant trustee—

HENRY R. GOETCHIUS,
Master in Chancery.

489 in said company and others, and to give and receive mortgages and to issue bonds of said company, in such manner and sums, as may be necessary, to have and to use a common seal, to make and adopt and amend and alter such a constitution and by-laws and regulations, consistent with the laws of this State, *and* necessary and proper, in the management of the business, and to appoint and select all officers and agents, necessary for the transaction of said business, with such other powers and privileges, consistent with law, *and* that will promote the objects and purposes of said associations.

Ordered and allowed by the Court, this 24th day of November, 1881.

(Signed) J. T. WILLIS,
Judge S. C. C. C.

(Here follows table, marked p. 489½.)

CHARTS

TOO

LARGE

FOR

FILMING

490 *Report on Water Supply of Columbus, Georgia, by B. M. Hall, of Hall Brothers, Civil and Mining Engineers, Atlanta Georgia, and Committee of City Council and Citizens.*

490½ Report on Water Supply of Columbus, Ga., by B. M. Hall, of Hall Brothers, Civil and Mining Engineers, Atlanta, Ga., and Committee of City Council and Citizens.

491 *Report of Water Works Committee.*

To the Hon. Mayor and Aldermen of the City of Columbus.

GENTLEMEN: We the undersigned, your committee, appointed to investigate the subject of water, in its relations to the municipality, under the following resolution of Council, adopted March 1st, 1893, to wit:

"WHEREAS, a large portion of this city is totally without a water supply, either for fire or other purposes; and,

"WHEREAS, the interests of this portion of our city urgently demands the attention of the city authorities; and

"WHEREAS, the supply of water now had, is deemed inadequate to the demands of the city; therefore, be it

"*Resolved*, That a special committee of three be appointed by the Mayor, from this Council, to act in concert with the following named citizens, viz: W. L. Tillman, F. D. Peabody and H. M. Howard, and make a full and complete investigation; First, of the necessities of the city as to water supply; Second, the most feasible and practical method of supplying this want; Third, the estimated cost of such supply; Fourth, the most practical method of raising the necessary funds for carrying out such suggestion as may be made.

"*Be it further resolved*, That said committee be, and they are hereby authorized to employ a competent engineer to make all measurements, surveys and estimates as may be necessary to properly carry into effect this resolution."

Which was subsequently amended by adding six more members to the committee, beg leave to report to your Honorable Body as follows:

Our committee being large, we subdivided our work, and appointed sub-committees to make special investigations and inquiries, reporting results to the general committee. Your committee by virtue of the authority in it vested, employed the engineering firm of Hall Brothers, of Atlanta, Ga., to make the necessary surveys and estimates, all of which was done by Mr. B. M. Hall of that firm, ably assisted by Mr. B. H. Hudson, our City Engineer, under the direct personal supervision and direction of our sub-committee on
492 engineering. Mr. Hall's report is very full, and your committee deems it desirable to herewith attach it as a part of its report, and recommend that it be printed in connection with, and as a part of the same.

Under our contract with Mr. Hall, his compensation for services rendered in this behalf, amounted to the sum of four hundred, ninety-six dollars and fifty-five cents ($496.55) which has been paid him, and for which your treasurer holds the voucher. Taking into consideration the scope of the investigation, and the amount of information carefully and systematically presented for your consideration, in the engineer's report, we are constrained to agree with your honored executive officer in his statement in an address, heretofore made to your Honorable Body, when he declared that money spent in this line of inquiry, would be "money well spent," and we feel assured that such is undoubtedly true in this instance.

We feel it proper to add that the employment of our engineer was not made until after an investigation of the professional standing of the firm, and the character of the work done would seem to sustain the reputation with which they came.

In addition to the foregoing, we have expended the sum of $20.30 in livery hire, type-writing, stationery and incidentals.

Taking up the first subject matter of your inquiry, to wit: "Of the necessities of the city as to water supply," we report that we find that over one-half of the area of the city is totally without a water supply, other than is had from ordinary wells. This portion of the city is usually known as Rose Hill, the North, and East Highlands, and is totally without water for fire purposes, or domestic purposes, under pressure.

We find the old part of the city, *i. e.* south of 17th street, or the greater portion thereof, being supplied with water from the Columbus Water Works Co. We refer to plate III of Mr. Hall's survey hereto appended, for a diagram showing the location, length and size of the city mains; from which it appears that a large portion, about one-third, of the city mains are only four (4) inch pipe. This is too small. Mr. Hall says: "As a matter of practice, it has been found that four inch mains are entirely too small. Engineers everywhere condemn their use where fire protection is desired, and recommend six inch as a minimum." We think that the main conduit, which is twelve inches is too small, and should not be less than eighteen inches. We refer you to plate IV of Mr. Hall's re-
493 port for an adequate and complete system of mains, from which it appears that the sizes recommended are 24, 16, 12, 8 and 6 inch.

If the city mains were of sufficient size, and the fire pressure sufficiently great, a large portion of the cost of the fire department could be saved; as in such case, a large proportion of the fires of the city could be controlled by the water works pressure, without the use of steamers, as is the case of other cities, notably Atlanta, where, out of a total of 253 fires which occurred during the year 1892, the steamers were used but twice, and in those instances, only on account of the long distance from the water mains to the point where the fires occurred; and where, quoting from a letter from W. R. Joiner, Chief Fire Department of Atlanta: "We have often had very good pressure through 1,200 to 1,500 feet of hose;" and where under a recent test, four streams simultaneously were thrown on top of the

Kimball House, by the pressure of the water works alone. Such a pressure as this is most desirable.

Referring to the plan of sanitary sewerage, which has been under consideration for the city, we are of the opinion that the present supply, pressure and size of mains, are totally inadequate to carry that system into successful operation.

We find that the supply of water now had, is inadequate in quantity and pressure for what we conceive to be the proper necessities, present, and prospective of the city.

In this connection, we herewith append as a part of our report, a table compiled from the U. S. Census Report of 1890, showing the average daily consumption of water per capita, in fifty of the largest cities of the Union that responds to the inquiry of the bureau, beginning with New York and ending with Rockford, Illinois; the highest being Buffalo, N. Y., 196 gallons per capita; and the lowest being Fall River, Mass., 25 gallons per capita. The average of these cities is between 88 and 89 gallons per capita. We find that where water is used in Columbus, that the allowance per taker is 125 gallons per day, which is estimated to be at the rate of 25 gallons per capita, per day. All over this amount used is charged for as excess over the regular rates.

Statement Showing Water Works Statistics for Each of Fifty of the Largest Cities of the United States That Have Made Complete Returns, Including Capacity of Supply, Number and Capacity of Reservoirs, With Days' Supply Stored, Daily Capacity of Pumps, Average Daily Consumption, With Gallons Daily to Each Head of Population, Parts of Distribution System, Total Cost of Works, Annual Charge for Water For An Average Dwelling, and Ownership.

Cities.	Capacity of supply (gallons).	Reservoirs.			Daily capacity of pumps (gallons).	Average daily consumption (gallons).	Gallons daily consumed to each head of population.
		Number.	Capacity (gallons).	Days' supply stored.			
New York, N. Y.	Unlimited	9	10,400,000,000	93	14,000,000	112,000,000	74
Chicago, Ill.	do.	.....	.....	.....	120,000,000	100,000,000	91
Philadelphia, Pa.	do.	11	891,482,454	8	185,000,000	116,000,000	111
Brooklyn, N. Y.	do.	3	1,180,000,000	24	60,000,000	50,000,000	62
Saint Louis, Mo.	do.	1	60,000,000	2	45,000,000	32,000,000	71
Boston, Mass.	do.	6	840,000,000	19	18,000,000	39,900,000	89
Baltimore, Md.	do.	8	2,274,000,000	57	6,000,000	40,000,000	92
San Francisco, Cal.	do.	7	91,000,000	5	19,000,000	20,000,000	67
Cincinnati, Ohio.	do.	4	120,000,000	4	45,000,000	34,000,000	115
Cleveland, Ohio.	do.	3	118,000,000	5	70,000,000	24,877,000	93
Buffalo, N. Y.	do.	1	125,000,000	3	95,000,000	50,000,000	196
New Orleans, La.	do.	1	4,000,000	.....	35,000,000	7,500,000	31
Detroit, Mich.	do.	1	36,000,000	1	80,000,000	35,273,888	171
Milwaukee, Wis.	do.	1	21,000,000	1	28,000,000	19,750,000	97
Washington, D. C.	687,000,000	3	321,880,000	9	8,000,000	36,000,000	177
Newark, N. J.	Unlimited	3	32,000,000	2	26,000,000	14,079,793	77
Minneapolis, Minn.	do.	.....	.....	.....	73,000,000	13,000,000	79
Omaha, Nebr.	do.	7	125,000,000	13	15,000,000	10,000,000	71
Rochester, N. Y.	do.	2	88,091,908	8	7,000,000	11,000,000	82
Saint Paul, Minn.	do.	1	16,000,000	2	6,000,000	8,000,000	60
Denver, Colo.	do.	2	20,000,000	1	28,000,000	15,000,000	141
Indianapolis, Ind.	do.	.....	.....	.....	22,000,000	6,000,000	57

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Worcester, Mass.	do	2	1,200,000,000	252	4,753,680	56	
Toledo, Ohio	do				16,000,000	5,000,000	91
New Haven, Conn.	do	2	17,000,000	2	15,000,000	10,000,000	123
Lowell, Mass.	do	2	31,500,000	6	12,000,000	4,944,000	64
Nashville, Tenn.	do	1	50,000,000	5	20,000,000	10,000,000	131
Fall River, Mass.	do	1	1,161,448	1	13,000,000	1,877,937	25
Cambridge, Mass.	do	3	655,000,000	157	21,000,000	4,182,025	60
Camden, N. J.	do	1	7,500,000	1	15,000,000	7,564,690	130
Trenton, N. J.	do	1	20,000,000	7	10,000,000	3,000,000	52
Lynn, Mass.	3,809,040	1	22,627,816	9	8,000,000	2,450,413	44
Hartford, Conn.	Unlimited	5	1,300,000,000	260		5,000,000	94
Evansville, Ind.	do	1	1,000,000		7,000,000	7,000,000	138
Los Angeles, Cal.	do	8	40,000,000	5	1,500,000	7,000,000	153
Lawrence, Mass.	do	1	40,000,000	16	10,000,000	2,500,000	56
Hoboken, N. J.	50,000,000	2	18,000,000	5	10,000,000	4,000,000	92
Dallas, Texas	Unlimited	2	145,000,000	41	13,000,000	3,500,000	92
Sioux City, Iowa	3,000,000	1	3,000,000	1	3,000,000	3,000,000	79
Portland, Me.	Unlimited	2	30,000,000	5		6,000,000	165
Holyoke, Mass.	3,500,000	1	70,000,000	28		2,482,393	70
Binghamton, N. Y.	Unlimited				9,000,000	3,000,000	86
Duluth, Minn.	do	1	4,000,000	2	5,000,000	1,836,336	55
Elmira, N. Y.	do	2	117,500,000	53	8,000,000	2,225,000	75
Davenport, Iowa	do	1	5,000,000	2	11,000,000	3,000,000	112
Canton, Ohio	11,000,000				6,000,000	1,000,000	38
Taunton, Mass.	1,000,000				6,000,000	769,557	30
Lacrosse, Wis.	Unlimited				6,500,000	2,284,402	91
Newport, Ky.	do	2	40,000,000	31	4,500,000	1,300,000	52
Rockford, Ill.	4,000,000				5,000,000	2,000,000	85

BOUND VERTICAL IN BOOK

Cities.	Distribution.						Total cost of works.	Annu'l charge for water for an av'r'ge dwelling. (a)	Per ct. of meters to taps.	No. of hydrants to each mile of streets.	By whom owned.
	Miles of mains.	No. of hydrants.	Number of taps.	Number of meters.	Number of fountains.	No. of watering *troughs.*					
New York, N. Y....	660	8,500	95,000	19,500	.....	.....	$40,000,000	$6 00	20.53	14.78	City.
Chicago, Ill.....	678	6,400	150,000	3,273	.....	.....	13,724,664	14 00	2.18	3.13	City.
Philadelphia, Pa....	930	7,433	170,911	304	646	343	18,500,000	9 00	0.18	6.46	City.
Brooklyn, N. Y.....	416	3,948	85,961	2,268	5	307	15,485,340	8 00	2.64	6.05	City.
Saint Louis, Mo.....	336	3,402	16,082	2,888	.....	.....	8,150,726	14 00	8.00	3.21	City.
Boston, Mass.....	631	6,045	77,337	3,861	74	67	22,129,255	12 00	4.99	14.82	City.
Baltimore, Md.. ..	407	1,220	.....	875	137	6	10,000,000	7 00	.....	1.56	City.
San Francisco, Cal...	342	1,661	.....	11,786	.....	.....	15,000,000	20 00	.....	4 86	Private.
Cincinnati, Ohio ...	271	3,133	37,397	1,420	3	853	3,500,000	12 50	3.80	6.45	City.
Cleveland, Ohio....	301	3,257	30,715	1,725	.....	.....	5,684,273	11 25	5.62	7.05	City.
Buffalo, N. Y.....	281	3,407	36,061	120	9	27	6,000,000	12 00	0.33	6.47	City.
New Orleans, La....	75	1,152	10,311	30	.....	.....	2,420,000	25 00	0.29	1.84	Private.
Detroit, Mich.....	359	2,237	37,725	763	.....	.....	4,400,505	10 00	2.02	5.59	City.
Milwaukee, Wis.....	176	1,433	16,986	4,780	39	50	3,136,920	11 00	28.14	3.42	City.
Washington, D. C...	215	1,085	26,990	71	15	39	3,575,000	4 50	0.26	4 62	Government.
Newark, N. J.....	176	1,460	21,532	556	.....	20	3,113,824	13 75	2.58	7.85	City.
Minneapolis, Minn..	142	1,795	8,473	372	12	27	2,269,970	5 00	4.39	2.24	City.
Omaha, Neb.....	142	1,113	6,000	1,000	2	12	6,000,000	12 00	16.67	2.19	Private.
Rochester, N. Y.....	215	2,043	23,146	2,000	8	43	4,152,123	7 00	8 90	8.51	City.
Saint Paul, Minn. ..	166	1,471	9,052	354	.....	6	2,858,401	8 60	3.91	1.52	City.
Denver, Colo.....	200	1,970	11,000	85	3	20	3,707,000	17 00	0.77	2.61	Private.
Indianapolis, Ind..	80	725	2,549	350	60	33	2,200,000	12 00	13.73	1.81	Private.
Worcester, Mass.....	114	1,121	9,001	7,923	.....	30	1,892,493	15 00	88.02	5.75	City.
Toledo, Ohio.....	70	461	3,500	375	10	4	1,250,000	11 00	10.71	1.05	Private.

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New Haven, Conn..	127	750	.....	50	2	9	1,742,023	12 00	.....	5.36	Private.
Lowell, Mass.	88	824	8,471	1,786	.....	21	2,283,396	13 00	21.08	7 85	City.
Nashville, Tenn.....	45	500	6,000	50	.....	4	.....	22 00	0.83	1.99	City.
Fall River, Mass....	63	634	4,800	3,500	10	17	1,861,439	15 00	72.92	5.98	City.
Cambridge, Mass....	106	648	18,158	231	11	6	2,563,248	17 00	2.27	8.20	City.
Camden, N. J	57	494	10,960	15	16	65	650,000	11 00	0.14	4.91	City.
Trenton, N. J.....	70	500	.....	100	.....	.....	582,384	10 00	.....	5.00	City.
Lynn, Mass.....	87	620	8,606	324	3	24	1,659,282	11 00	3.76	4.66	City.
Hartford, Conn.....	80	488	5,984	345	3	8	1,743,168	9 00	5.77	3.75	City.
Evansville, Ind.....	43	306	.....	4	.....	24	500,000	15 00	.....	2.25	City.
Los Angeles, Cal....	245	260	10,650	320	3	25	1,825,000	24 00	3.00	0.33	Private.
Lawrence, Mass.....	56	502	4,745	1,213	3	14	1,697,105	12 00	25.56	6.12	City.
Hoboken, N. J.....	17	170	4,100	1,200	4	6	150,000	11 73	29.26	5.57	Private.
Dallas, Texas.	35	195	1,700	12	2	4	400,000	31 00	0.71	0.37	Private.
Sioux City, Iowa....	25	129	2,500	50	3	1	195,000	12 00	2.00	0.38	City.
Portland, Me.	106	424	6,918	221	.....	21	2,827,903	23 00	3.19	7.57	Private.
Holyoke, Mass.....	47	301	2,454	145	6	4	576,739	11 00	5.91	6.02	City.
Binghamton, N. Y...	35	318	4,081	257	.....	7	550,000	15 00	6.30	3.98	City.
Du uth, Minn.....	30	199	1,059	58	.....	1	824,692	20 00	5.48	0.89	Private.
Elmira, N. Y.....	40	279	1,800	315	7	.....	574,259	18 00	17.50	2.10	Private.
Davenport, Iowa....	34	319	1,405	40	7	10	1,000,000	*b* 8 00	2.85	2.28	Private.
Canton, Ohio	33	255	2,050	.....	1	6	250,008	8 00	.....	1.70	City.
Taunton, Mass.....	59	513	3,143	938	13	12	571,995	13 00	29.81	2.57	City.
Lacrosse, Wis.....	20	184	1,304	.....	5	12	191,164	12 00	.....	1.47	City.
Newport, Ky.	28	165	3,700	101	2	30	800,000	17 00	2.73	5.50	City.
Rock Island, Ill.....	42	284	2,500	8	8	11	400,000	11 00	0.32	2.37	City.

a An "average dwelling" is one occupied by one family, not exceeding seven rooms, with one bath room (including hot and cold water) and one water closet.

b For one family; fixtures allowed not specified.

ND VERTICAL IN BOOK

498 We believe that an abundant supply of cheap and wholesome water is inseparably connected with the health, prosperity and progress of a city. We therefore report that the supply of water for the City of Columbus, should not be less than 100 gallons per day, per capita, estimated on a basis of a population of 30,000, or 3,000,000 gallons per day of 24 hours.

We further find, that the pressure, for both domestic and fire purposes, is too low for the necessities of the city—the maximum being 45 pounds.

We recommend a pressure of not less than 40 to 50 pounds for Rose Hill and the elevated portions of the city, and of 75 to 90 pounds for the lower part of the city. We are more especially led to make this recommendation from the fact that the water pressure now available is but of little practical value at fires; almost the whole dependence being on engines.

Under this head of our investigation, we further report that we find one of the great necessities of the city as to water supply, is, that water should be so cheap that it should be easily within the reach of all. We do not find this to be the case in Columbus. We find that there is something less than 1,000 water takers in the city. Estimating five persons to each family, this would show that only 5,000 people out of a population of 20,000 are being supplied with water works water. Were it cheaper, a much larger number would take it. We herewith include a comparative statement of cost to water takers between Augusta, Ga., and Columbus.

Columbus Water Works Co.

"Meter Rates:—For private dwellings and other small outlets, $3.00 per quarter, payable in advance, which entitles the consumer to an average of 125 gallons of water per day. Any excess, up to an average of 500 gallons per day, will be charged at a rate of 25 cents per thousand gallons, payable at the end of quarter. Above this amount, rates are as follows:

500	to 1,000	gallons daily	.20	cents per M
1,000	to 5,000	do	.18	do
5,000	to 10,000	do	.16	do
10,000	to 15,000	do	.14	do
15,000	to 20,000	do	.12	do
20,000	gallons per day and upward		.10	do

499 Revised October 1st, 1893.

500	to 1,000	gallons daily	.20	cents per M
1,000	to 3,000	do	.18	do
3,000	to 5,000	do	.16	do
5,000	to 10,000	do	.14	do
10,000	to 15,000	do	.12	do
15,000	to 20,000	do	.10	do
20,000	and upward,	do	.08	do

Augusta, Ga.

We make the following extract from a letter from the Mayor of Augusta.

"The cost of water to consumers is very cheap, depending on number and character of openings, $6.00 to $10.00 per year covers cost of a good large family." "No meters are used except by the large Mills." "We collect water rents once a year in advance from families and property holders, $5.00 frontage, which pays for one hydrant or opening of any character; all additional openings are charged for $1.00 to $2.00 per year each."

We also herewith include four water bills; two paid to the Columbus Water Works Co., and two to the Griffin Water Works Co., which shows a rate for manufacturing purposes charged by the Columbus Water Works Co. of 18 cents per thousand gallons; by the Griffin Water Works Co., to the same consumer, of 8 cents per thousand gallons.

"COLUMBUS, GA., *Dec. 1st*, 1892.

Monthly Account.

Mess. M. T. Bergan & Co., Premises Broad and Dillingham Streets, to The Columbus Water Works Co., Dr.

For water used during month of Nov.

Statement of meter December 1, 1892	324,350
" " November 1, 1892	305,520
Difference in cubic feet	18,830
Being 141,235 gallons at 18 cents per 1000 gallons	$25 40"

500 "COLUMBUS, GA., *Nov. 1st*, 1892.

Monthly Account.

Mess. M. T. Bergan & Co., Premises: Broad and Dillingham Streets, to The Columbus Water Works Co., Dr.

For water used during month of Oct.

Statement of meter November 1, 1892	305,520
" " October 1, 1892	287,920
Difference in cubic feet	17,600
Being 132,000 gallons at 18 cts. per 1000 gallons	$23 75"

"GRIFFIN, GA., *April 21st*, 1893.

Griffin Ice Works, to Griffin Water Works, Dr.

Nov. 1st.—435,000 gallons water for Oct.....$39 15"

"GRIFFIN, GA., *April 21st*, 1893.

Griffin Ice Works, to Griffin Water Works, Dr.

Dec. 1st.—73,500 gallons water for Nov.....$6 61"

We think that an average dwelling should be supplied at a cost of not over $6.00 to $8.00 per annum.

We find the meter system in use in Columbus; and for the purpose of preventing the waste of water, it is advantageous, but the allowance to the taker ought to be so large as that the fear of having to pay excess charges will not operate to deter the free and plentiful use of water; and we fear that such is the case where the amount allowed to each person is only twenty-five gallons per day, as is the case in Columbus, all over 125 gallons per dwelling being charged for as excess.

We find no manufacturing enterprise of any kind in Columbus now being run with water power supplied by the Columbus Water Works Company; several having commenced its use and discontinued it on account of lack of sufficient pressure and the cost.

We deem it especially desirable that a city should have a water system of sufficient pressure and cheapness to warrant its
501 profitable use for power by small manufacturing enterprises.

Under the second head of inquiry, viz: "The most feasible and practical method of supplying this want," we report that we recommend the ownership by the city of its own water works, provided that such works shall be capable of giving a supply and pressure sufficient for the present and prospective demands of the city, and at such cost to the consumer as shall bring the plentiful use of good water within the easy reach of all.

Of the fifty cities hereinbefore enumerated, thirty-six own and operate their own water works, and fourteen are owned by private companies. "The average cost per average dwelling, not exceeding seven rooms with bath room (including hot and cold water) and one water closet," for the thirty-six cities reported, who own their own systems, is $11.63. The same for the fourteen cities reported, who are supplied by private companies or systems, is $18.20, an increase of over 50 per cent. in cost to the consumer. We estimate that a proper and efficient system of water works, ample for the present and prospective wants of the city, giving a daily supply of 4,000,000 gallons now, and a possible daily supply of 6,000,000 gallons, delivered through a twenty-four inch conduit, and a pressure on Rose Hill of fifty-four pounds, and on Broad street of ninety pounds, with a storage capacity of 580,000,000 gallons, and an intermediate clear water delivering basin of 20,000,000 gallons, can be constructed at a total cost of about $300,000.00, the annual interest charge on which would be $13,500.00, if that sum was raised on a bond issue at 4½ per cent. interest, at par.

At present, the city's annual cost for water is between $8,000 and $9,000, and for the maintenance of the fire department, about $20,000.

If we had a fire pressure capable of throwing an effectual stream on our highest buildings at fires, a very large percentage of our fires would be controlled without the use of engines.

We find that with a hydrant pressure of ninety pounds, a vertical stream of ninety feet can be thrown through 100 feet of 2½ inch hose, and 1¼ inch nozzle; and the discharge for twenty-four hours would be 466,000 gallons.

And we feel that we can safely estimate a saving of from 30 to 40 per cent. in the cost of the fire department with such a pressure.

If this is a safe estimate, then the city's water and the
502 saving in the fire department will nearly pay the interest charges and leave the water rents from the citizens to go almost entirely to pay the running expenses of the works and the providing of a sinking fund for the retirement of the bonds.

We estimate that the rentals from the water works, even at the low rate we think desirable, would amount to, at least, $20,000.00 per annum, for as the rate is lowered, the number of takers would inevitably increase. This would, we estimate, pay the running expenses and provide for a sinking fund ample to retire the bonds in from twenty-five to thirty years.

It is the sense of your committee that few, if any cities of the United States, are so favorably situated as Columbus, for the construction and maintenance, at the minimum of cost, of a thorough, economical and efficient system of water works.

The city of Augusta owns its own water works. We again quote from the letter of the mayor of that city: "We pump directly into the city mains from the reservoir daily supply 4,000,000 gallons. Even at the cheap rates we sell water to the people and supply power to the manufacturers ($5.50 per horsepower per annum) our income from water works and water rent, even now pays three-fourths of the interest on our public debt, and will pay it all in a few years."

Again, from the message of the mayor of Augusta for 1892, it appears that they have 4573 private openings, 343 hydrants, fourteen public drinking fountains, forty miles of mains, the minimum being six inches. Total value of plant, $312,000.00.

And that "the income from the water works is, as now on digest, 1893, $50,000.00, or 16 per cent. on value of works; and as the mains are extended, the income will increase yearly."

The foregoing estimate as to the cost of an efficient system of water works for Columbus is predicated on Mr. Hall's survey and estimate of what he calls the Chattahoochee Falls plan, with reservoir on Factory Hill, and 580,000,000 gallons storage reservoir on Roaring Creek, and has reference to that plan.

We have embodied our answer to the third head of your inquiry, under that of the second.

Under the fourth head, as, "The most practical method of raising the necessary funds for carrying out such suggestions as may be made." We think that all funds necessary for supplying the city with water could be raised by the sale of 4½ per cent. thirty year bonds.

503 For a temporary expedient to supply that portion of the city at present without water, it would appear that the plan outlined in Mr. Hall's report, which he calls a modification of Mr. Swift's plan, is not without merit. However, as this plan involves changes in the system of the company, a private corporation at present supplying the city with water, we forbear to make any recommendations in reference thereto, but simply call the attention of council to the same.

In closing our report, we deem it fair to state that the present officials of the Columbus Water Works Company have promptly and cheerfully afforded this committee and its engineer facilities for aiding our investigation, and for gathering information, and we feel assured that in whatever respect their service may fall short of what we feel to be the physical necessities of the city, that it arises from inherent defects of the system, for which they are not responsible, and not from intent or neglect on their part.

All of which is respectfully submitted.

JNO. F. CLEGG,
W. R. BROWN,
FRANCIS D. PEABODY,
H. H. DANIEL,
JOHN K. HARRIS,
W. L. TILLMAN,
W. L. CLARK,
I. JOSEPH,
H. M. HOWARD,
W. A. SWIFT,
W. E. MARCRUM,
C. E. CAVERLY,
Committee.

Columbus, Ga., November 9th, 1893.

504 *Report on Water Supply of Columbus, Ga., by B. M. Hall, of Hall Brothers, Civil and Mining Engineers, Atlanta, Ga.*

ATLANTA, GA., *August 8th*, 1893.

Messrs. W. L. Tillman, John F. Clegg, and W. R. Brown, Committee City Council, Columbus, Ga.

GENTLEMEN: Having been employed by you to make certain surveys and investigations concerning the present and available water supply of Columbus, Ga., and having completed said work, I respectfully submit the following report:

Surveys.

During the month of June, this year, I made the following surveys:

1. Survey of shoals at Chattahoochee Falls, old factory.

2. Distance and levels old factory to Factory Hill, and from old factory to site of proposed Roaring creek dam.

3. Survey for dam on Roaring creek and cross section and levels of ground to be covered by reservoir, to find depth, and capacity.

4. Cross section and levels on Factory Hill for estimate on pressure reservoir.

5. Computed area of Roaring creek water shed.

6. Connected above surveys with B. H. Hudson's former surveys to city.

7. Survey of Geo. M. Clapp water power, fall in river, location of power canal, pumping station, etc.

8. Distance and elevation of Clapp Hill, with relation to
505 proposed pumping station, Roaring creek dam and Hudson's survey, etc.

9. Line of levels from Factory Hill, via North Highlands and Lover's Leap, to city.

10. Survey of Lover's Leap water power.

11. Survey of Holland's creek water shed; also, of Stewart & Bradford water shed.

12. Cross section survey and regular soundings of upper and lower reservoirs of Columbus Water Works Company, to get capacity.

13. Difference in levels of the two reservoirs.

14. Measurements of flow of water in Roaring creek, Holland's creek, Stewart branch, Bradford branch and Stewart spring.

Besides making the above surveys, I obtained from Mr. B. H. Hudson, your city engineer, the notes of a transit and level survey made by him in 1881, for a pipe line from Roaring creek to city; also, of a transit and level survey from lower reservoir to city. My levels from Roaring creek to city coincide with his. I ran no levels from water works reservoirs to city. In this report the distance to city from Clapp Hill, Factory Hill and lower reservoir, and the level of lower reservoir above the city, are based upon Mr. Hudson's surveys. The elevation of Stewart spring is from surveys of Mr. Hudson and Mr. J. G. Beasley.

In addition to the surveys enumerated, I have received a great deal of valuable data from the Columbus Water Works Company, and I take pleasure in stating that both the Columbus Water Works Company and your committee have afforded me every facility for making a free and fair investigation.

Source of Supply.

The different sources of supply that have been suggested for Columbus are: Artesian wells, the Chattahoochee river, Mulberry creek; and local streams.

Artesian Wells would hardly be possible at Columbus, as the only pervious strata there are in the shallow surface formation overlying the bed-rock, and have free outlets into the river and other streams. The hard gneiss which would be struck at a depth of forty feet or less, has no regular continuous strata, and no spaces for water except in irregular breaks or fissures. A well bored deep enough in this
rock would cut enough of these breaks to furnish a consid-
506 erable amount of water, but it would be like the water of the so-called artesian well of Atlanta—simply an accumulation of local surface waters, which would be easier to obtain without so much boring.

The Chattahoochee River, as a source of supply, has the two-fold advantage of being near at hand, and in affording an unlimited quantity of water without empounding. It, however, has the two-fold disadvantage of extreme muddiness, and a known contamination. The first of these disadvantages is real, but not serious; the second may be altogether imaginary, but it is, nevertheless, quite serious. Mud can be entirely removed by filtering. It is nothing

more than fine clay in suspension, and its removal is only a question of expense. There is nothing repulsive in the thought of drinking water that has contained it. Sewerage is different. The knowledge that a large amount of filth running from the sewers of Atlanta is pouring into the river in a ceaseless stream, makes the thought of river water, for drinking, anything but pleasant. As a matter of fact, I do not believe that an analysis of the water would detect poisonous substances in sufficient quantities to be considered dangerous. The dilution of the sewerage entering the river is so great, and the chances for aeration and decomposition into its original chemical elements are so many, that I think the water could be safely adopted as a city supply. In fact, hundreds of cities are using just such water. But they are using it because they have no better source of supply. In the present case, however, there are other available sources free from a known pollution.

Mulberry Creek is a large creek about sixteen miles north of Columbus, which I did not examine. Mr. Hudson states that it has a high elevation above the city and a plentiful supply of water. He made a survey to it with the idea of bringing the water all the way in pipes. This he found impracticable on account of the distance. If the ground is suitable, the water might be brought the greater part of this distance in a swift, narrow canal, pipe being used to cross the ravines. In gold mining regions, we have conveyed water long distances in this way at a very moderate cost. On ordinary clay soil, a canal with a grade of three feet per mile and a capacity of 6,000,000 gallons per day, can be cut for $1,200 per mile. Not knowing the ground, I cannot say how much pipe would be necessary, or how much the distance would be increased by
507 reason of the circuitous route taken by the canal in finding ground on the proper level.

Local Streams.

There are three streams near the city of Columbus, any one of which is capable of furnishing a large amount of empounded water of the best quality. These are Holland's creek, Roaring creek and Standing Boy creek. Their locations are shown on general map plate I, herewith.

The city of Columbus is situated at the shore line of the Archæn or Azoic region of Georgia and Alabama. The bed rock that forms the shoals of the Chattahoochee, and over which it falls 120 feet in a short distance, is a hard Laurentian Gneiss. Lying unconformably upon this bed rock, is a cretaceous formation of clay, sand and gravel, the depth of which is from twenty-five to forty feet in the city, and from eighty to 100 feet in some of the high hills to the north and west.

It forms a thin covering to the water sheds of Holland's creek, Roaring creek, and that of the greater part of Standing Boy creek, and is a great advantage to them in furnishing a surface containing very little soluble coloring matter of the kind that makes muddy water.

Underneath the surface of these water sheds it is impossible to

tell the exact shape of the bed rock. It has no conformity to the strata of the younger formation.

For untold ages it was a naked rock, eroded and washed into irregular corrugations by floods that were totally different in intensity and direction from the floods due to the local rain storms of the present age, that have carved out the existing local water sheds in the surface formations. This being the case, it is clear that some portions of the ancient bed rock might so underlie a dividing ridge that the water reaching it by percolation could drain off into an adjacent water shed, instead of going into the stream to which it naturally belongs. My investigations of these local streams have not been sufficient for me to form a judgment as to any actual water shed leakage that may be taking place. In order to gain any exact information, a careful and systematic topographical survey of the region would be necessary, with simultaneous measurements of flow in streams at the dryest season of the year. I took the flow in some of these streams and left my measuring weirs in, so that other observers could measure the depth of water flowing over them at a later date, and report to me.

508 The following statement gives water measures taken on Holland's creek and two smaller streams, showing the flow in gallons per minute at times when there had been no rain for several days, and the streams had their ordinary flow for the time of year.

Holland's Creek.

June 30th.—Flow per minute, 507 gallons. Observer, B. M. Hall.

July 1st.—Flow per minute, 270 gallons. Observer, B. H. Hudson.

July 24.—Flow per minute, 135 gallons. Observer, B. H. Hudson.

Roaring Creek.

June 2d.—Flow per minute, 825 gallons. Observer, B. M. Hall.

June 30th.—Flow per minute, 558 gallons. Observer, George M. Clapp.

July 1st, 5 P. M.—Flow per minute, 464 gallons. Observer, B. M. Hall.

July 2d, 6 A. M.—Flow per minute, 558 gallons. Observer, B. M. Hall.

July 24th.—Flow per minute, 270 gallons. Observer, W. L. Tillman.

Small Streams.

Stewart spring, June 30th.—Flow per minute, 36.6. Observer, B. M. Hall.

Stewart spring, July 24th.—Flow per minute 22 gallons. Observer, B. H. Hudson.

Stewart branch, opposite reservoir, June 30th.—Flow per minute, 97 gallons. Observer, B. M. Hall.

Bradford branch, opposite reservoir, June 30th.—Flow per minute, 70 gallons. Observer, B. M. Hall.

All that the observer had to do in these measurements was to find with a pocket rule the depth of water above a point previously established by me.

The water sheds of these creeks are:

1. Holland's creek, both prongs, above dam of upper reservoir, 3,640 acres.

2. Stewart and Bradford branches combined above level of upper reservoir dam, 372 acres.

3. Roaring creek, both prongs, above site of proposed dam, 4,056 acres.

509 It is noticeable that the difference of flow between Holland's creek and Roaring creek, measured on same dates and under same conditions, is out of proportion to the difference of their water shed areas. So far as these measurements can be taken as an indication, they show that a larger percentage of the rainfall can be stored on Roaring creek than on Holland's creek. At time of heavy rains, the flood water would be practically the same per square mile of water shed. The surface evaporation per square mile of water shed would be the same at all times, on the two sheds, and the evaporation from surfaces of reservoirs would be the same for the same area in each; but the observed dry weather flows of the streams indicate a difference in the percentage of rainfall lost by percolation into adjoining water sheds.

Now, with the water sheds of Roaring creek, and a reservoir of 580,000,000 gallons capacity, we consider the following a safe basis for the loss of rainfall:

Reservoir leakage, 1 per cent. of total rainfall; reservoir evaporation, 3 per cent. of total rainfall; water shed evaporation, 38 per cent. of total rainfall; water shed percolation, 8 per cent. of total rainfall. Total loss, 50 per cent. of total rainfall.

This leaves 50 per cent. of the total rainfall as available for storage.

Comparing the minimum observed flow in the two streams, we find that Roaring creek was yielding at that time 42.65 gallons per square mile of water shed, while Holland's creek was yielding 23.73 gallons per square mile. Assuming that this difference is due to percolation, and allowing 8 per cent. for Roaring creek, the proportionate allowance for Holland's creek would be 14.4 per cent., and the loss of total rainfall not available for city supply would be:

Reservoir leakage, 1 per cent. of total rainfall; reservoir evaporation, 3 per cent. of total rainfall; water shed evaporation, 38 per cent. of total rainfall; water shed percolation, 14.4 per cent. of total rainfall. Total loss, 56.4 per cent. of total rainfall.

Leaving 43.6 per cent. of the total rainfall as available for storage.

As a matter of safety, I shall use this percentage in calculating the water supply from Holland's creek; but I am not at all certain that it is a fair one. The investigation has been too meagre 510 to base a fixed judgment upon. With the data I have before me it is the highest per cent. I can allow. If there are invisible sources of supply, such as large springs in the reservoirs, their flow, if it could be ascertained, should be added to the measured flow

of the streams. But I cannot make an allowance for them without knowing of their existence, or the amount of their flow.

Columbus Water Works Company.

The present water supply of Columbus is furnished by the Columbus Water Works Company, from Holland's creek in Alabama, by gravity from two reservoirs about four miles from the city.

Plate II shows their location and capacity. The upper is the compounding reservoir, and the lower is the clear water basin, from which the twelve inch main (called the "conduit" in this report) takes the water to the city.

The upper reservoir covers 17.1 acres, has a maximum depth of fifteen feet, an average depth of seven feet, and a storage capacity of 39,392,000 gallons.

The lower reservoir covers 3.85 acres, maximum depth, twenty-one feet; average depth, 9.5 feet; storage capacity 12,078,000 gallons.

Combined storage of both, 51,470,000 gallons. Water shed above upper reservoir dam, 3,640 acres, or, 5.68 square miles.

The Stewart branch and Bradford branch run together and enter Holland's creek a short distance below reservoirs. They have a combined water shed of 372 acres above the level of upper reservoir dam.

Quality of Water.—I have never seen an analysis of the water but it is soft, and was always clear while I was at Columbus. I saw nothing in its appearance or surroundings to make me doubt its fitness for a city supply.

Present Supply.—I have before me the pressures taken by your committee at base of stand pipe in the city for every hour in twenty-four, beginning with July 31st, at 6 P. M., and ending August 1st, 6 P. M., from which I compute the consumption during that twenty-four hours to be 768,000 gallons. It rained very hard during the night and wet the ground thoroughly, so that there was no street and lawn sprinkling on August 1st. The effect of this rain is shown by the consumption being 884 gallons per minute at 6 P. M. July 31st, while at 6 P. M. August 1st, it was only 590 gallons per
511 minute. The total consumption for this twenty-four hours cannot be taken as an average daily consumption, but can probably be considered a minimum for fair weather during the summer. By comparing these pressures with the pressure cards taken July 22d to July 25th, by the automatic register at fire department headquarters back of Rankin House, I have arrived at an average consumption that I think is a near approximation to the correct one. This is 920,000 gallons per twenty-four hours. The calculation for consumption is made from capacity of conduit under different heads and the pipe is presumed to be clear of obstructions.

Of course it would be impossible to get a supply of 920,000 gallons from Holland's creek, or Roaring creek either, without an compounding reservoir. The entire daily flow of both streams would not furnish this amount during dry weather in summer and autumn. With such streams a certain amount of the storm water from rains must be caught and distributed over the frequent periods of

meager flow when the stream is not able to supply the amount wanted. If the reservoir is so large that none of the flood water runs to waste, we obtain the full amount that the water shed is capable of supplying. If the reservoir is of limited capacity, a large amount will run to waste, but a certain daily supply will be obtainable in proportion to its capacity.

By a close study of the records of the Columbus rainfall for the last ten years, I am satisfied that there are very few months during the decade, when Holland's creek, by the assistance of a 51,000,000 gallon storage, could not furnish 1,000,000 gallons per day as a city supply. In October 1884, 1886 and 1891, and possibly in some other months, the supply would have been considerably short of that amount.

According to the records, 1891 was the dryest year of the last ten, or rather it had the dryest autumn. Such seasons are sure to recur, and should be provided for by increasing the storage capacity of present reservoirs, or empounding a reserve on the Stewart and Bradford water sheds to be drawn on in cases of emergency. There is an excessive leakage in the dam of the lower reservoir, which will naturally interfere with any close calculations on storage.

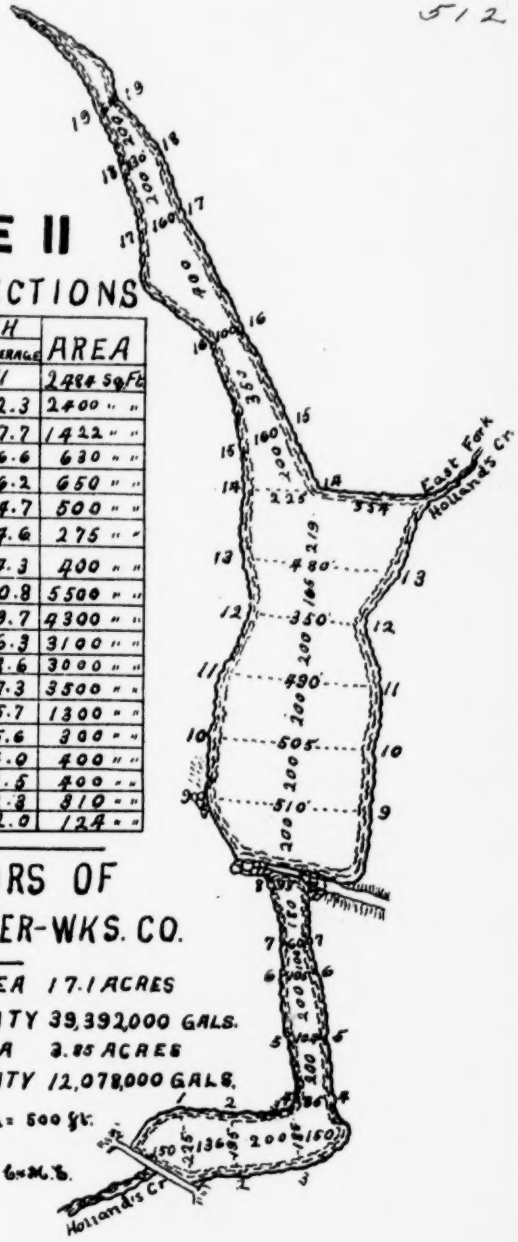
The greatest supply obtainable from Holland's creek is shown as follows:

(Here follow Plate II and Plate III, marked pp. 512 and 513.)

PLATE II

CROSS-SECTIONS

	NO	WIDTH	DEPTH MAX.	DEPTH AVERAGE	AREA
UPPER RESERVOIR	1	225	21	11	2498 Sq Ft
	2	195	18.	12.3	2400 " "
	3	185	10.4	7.7	1422 " "
	4	95	8.8	6.6	630 " "
	5	104	8.0	6.2	650 " "
	6	105	6.9	4.7	500 " "
	7	60	6.3	4.6	275 " "
	8	93	6.2	4.3	400 " "
LOWER RESERVOIR	9	510	14.	10.8	5500 " "
	10	505	13.	9.7	4300 " "
	11	490	12.	6.3	3100 " "
	12	360	10.5	8.6	3000 " "
	13	480	9.7	7.3	3500 " "
	14	225	7.8	5.7	1300 " "
	15	160	7.2	5.6	900 " "
	16	100	5.0	4.0	400 " "
	17	160	4.0	2.5	400 " "
	18	130	3.0	2.3	310 " "
	19	62		2.0	124 " "



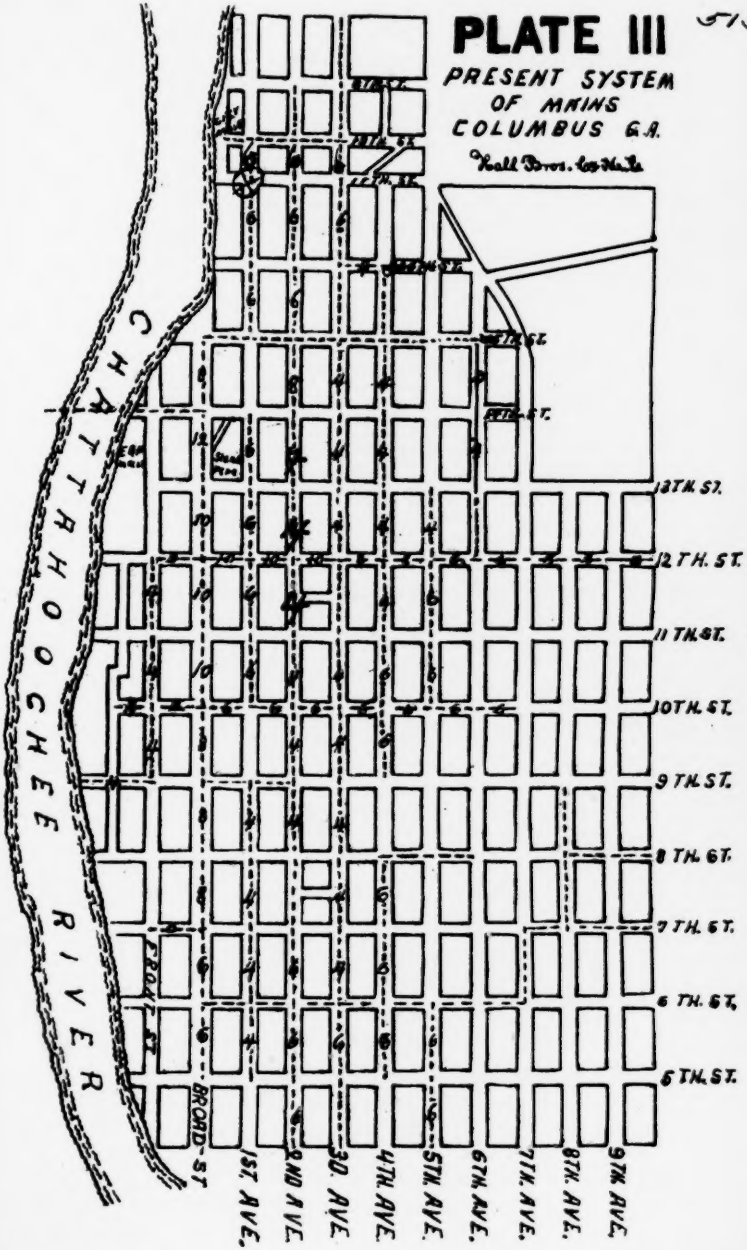
RESERVOIRS OF COLUMBUS WATER-WKS. CO.

UPPER RES., AREA 17.1 ACRES
" " CAPACITY 39,392,000 GALS.
LOWER " AREA 3.85 ACRES
" " CAPACITY 12,078,000 GALS.

PLATE III

PRESENT SYSTEM
OF MAINS
COLUMBUS G.A.

Hall Bros. Co. Hartford



514 A one inch rainfall over the water shed tributary to the upper reservoir (3,640 acres) amounts to 98,000,000 gallons. As shown elsewhere, 43.6 per cent. of this amount is available for storage and use. This amounts to 43,000,000 gallons for each inch of rainfall on the water shed.

The records of the monthly rainfall, as furnished me by the United States' Weather Bureau, show, for the last ten years, the following monthly averages:

January, 4.14 inches; February, 5.10 inches; March, 7.29 inches; April, 1.94 inches; May, 2.97 inches; June, 4.43 inches; July, 6.09 inches; August, 5.30 inches; September, 3.47 inches; October, 1.51 inches; November, 3.38 inches; December, 4.49 inches.

During the dry autumn of 1891 the records show, for September, 1.11 inches; October, 0.0 inches, and November, 4.29 inches.

The above data enables us to find the greatest safe supply obtainable from the creek. For the conditions presented, the reservoir should have a capacity of 520,000,000 gallons, which is in the same proportion to water shed as reservoir of 580,000,000 gallons proposed for Roaring creek. In this estimate we take the average monthly rainfalls for all the months except September, October and November, which, as a matter of safety, are taken from the records of the dry autumn of 1891. From this data we have computed the following:

Table Number One.

Showing a 5,000,000 gallon per day supply from Holland's creek water shed, with a reservoir holding 520,000,000 gallons.

Month.	Inches of rainfall.	Storage for month in million gallons.	Water in res'rv'r in million gallons.	Millions gallons used in month.	Millions gallons surplus.	Milli'ns gallons over-flow.
December	.....	.....	.....	.....	180 3	....
January	4.14	178.0	258.3	155.0	103.3	....
February	5.1	219.3	326.6	140.0	182.6	....
March	7.29	313.5	496.1	155.0	341.1	....
April	1.94	83.4	424.5	150.0	274.5	....
May	2.97	127.7	402.2	155.0	247.2	....
June	4.43	190.5	437.7	150.0	287 7	....
July	6.09	261.9	520.0	155.0	365.0	29.6
August	5.30	227.9	520.0	155.0	365.0	72.9
September	1.11	47.7	412.7	150.0	262.7	....
October	0.0	00.0	262.7	155.0	107.7	....
November	4.29	184.5	292.2	150.0	142.2	....
December	4.49	193.1	335.3	155.0	180.3	....

515 It will be seen from the foregoing that the supply obtainable from such a creek is mainly a question of storage.

Conduit, Street Mains, etc.

Under the head of "Question No. 13" I have given an inventory, showing the number of feet of piping of different kinds in the

present system, as derived from a report of Mr. M. H. Tuggle, Supt. According to Mr. Hudson's survey the length of conduit from lower reservoir to stand pipe on Broad street is 19,600 feet. It consists of 19,000 feet of 12 inch pipe and 700 feet of double 9 inch pipe across bridge so arranged as to distribute the weight more evenly on the bridge. As these two pipes have practically the same capacity of water way as one 12 inch pipe, we shall hereafter consider the whole conduit as 19,700 feet of 12 inch pipe. By Mr. Hudson's levels the top of the stone dam of lower reservoir is 115 feet above Broad street at stand pipe. As the flash boards on dam raise the water about two feet higher, the elevation of water surface will be 117 feet. The conduit is connected with the street mains and with a stand pipe, 20 feet diameter and 120 feet high.

The distribution as compiled from Mr. Tuggle's report is shown in Plate III.

Pressures and Flow in Pipes.

If the entire system were at rest, and no water escaping from the taps, the stand pipe would fill to the exact level of the reservoir and the hydrostatic pressure in that portion of the city which is level with the bottom of the stand pipe would be 50.78 pounds per square inch. If a hydrant is opened, water begins to flow, and a current corresponding to the outflow at once begins in the mains leading to hydrant. The equilibrium has been broken and the entire system must adjust itself to the new conditions. The water will continue to lower in the stand pipe until a new position of stand pipe equilibrium is reached, in which water ceases to flow out of the stand pipe, and the current from the conduit main simply flows past it toward the open hydrant. The amount that the water has lowered in the stand pipe will be exactly equal to the head necessary to produce the required current in the conduit between the reservoir and stand pipe; and will be the measure of the general decrease of pressure on any pipes leading from the main near the stand pipe and not having a current in them going towards the open hydrant. This decrease of pressure will be .434 of a pound for every foot that the water has lowered in the stand pipe. Any pipe in which there is a current toward the open hydrant will suffer, at a given point, an additional decrease of pressure due to the friction in pipe or pipes between the stand pipe and said point, and any dead-end branch pipe leading from said point will suffer the same additional decrease of pressure. Now, if the hydrant is closed the current between the stand pipe and the hydrant will immediately stop, but the current between the reservoir and the stand pipe will continue with a constantly decreasing velocity until the stand pipe fills to the level of the reservoir. When this has taken place each point in the system of city mains will have a pressure due to its level below the level of the surface of the reservoir.

516

In the foregoing we have supposed only one outlet in order to simplify the discussion. But it would be readily seen that the same principles hold good, and the same conditions exist when taps are opened all over the city at once. The aggregate amount of water

being used will produce a certain flow of water that must come from somewhere. If the surface of the water in the stand pipe is above the hydraulic grade line due to the aggregate outflow, part will come from the stand pipe and part directly from the reservoir through the conduit. The water in the stand pipe will gradually fall until it reaches a level that will give sufficient grade or fall for the conduit to bring all the water required without the assistance of the stand pipe.

In ordinary service water is running all the time, and there are no very sudden changes in the aggregate discharge. Except in cases of fire, the changes of level in the stand pipe are very gradual and the difference of level between its surface and the surface of the reservoir will, at a given time, be the effective head that is pushing the water through the conduit to supply the city. But a given head will supply a definite amount of water through a certain pipe of given length and diameter. So all that we have to do is to find the level of water in the stand pipe and subtract it from the level in the reservoir to find the head, to calculate the amount of water that will flow through the conduit under this head.

A pressure of 40 pounds on Broad street near stand pipe shows a water surface in stand pipe 92 feet above Broad street. Subtracting this from 117 feet, the height of reservoir above Broad street, leaves 25 feet as the head operating to push the water through the conduit to the city. 19,700 feet of 12 inch pipe under this head
517 will deliver 632 gallons per minute, which is the consumption in the city while the pressure is exactly 40 pounds at the foot of the stand pipe. When the pressure, here, changes, it shows that a change in the rate of consumption has taken place. If the pressure decreases it shows an increased consumption, and vice versa.

For your convenience I have calculated the following table from which you can estimate your consumption at any time by observing pressure at the base of the stand pipe. The source being the lower reservoir.

Table Number Two.

No. lbs. pressure at base of stand-pipe.	Consumption in gallons per minute.	No. lbs. pressure at base of stand-pipe.	Consumption in gallons per minute.
50.70	000	38	690
48	278	37	735
46	378	36	756
45	440	35	777
44	485	34	816
43	530	33	843
42	568	32	862
41	590	30	931
40	630	3.9	1414
39	671	0.	1495

In the last case the water is supposed to be flowing from a free end 12 inch in diameter at base of empty stand pipe.

Effect of Stand Pipe on Service.

When a sudden and excessive draft is made on any tap in the city, making the aggregate demand greater for the moment than the amount of water that is coming into the city through the conduit the stand pipe readily yields to the demand, furnishing the surplus required, its surface being lowered until the increased head made thereby in the conduit is sufficient to make the flow in the conduit supply the total demand without help from the stand pipe. In case the tap is closed before this point is reached, the increased flow in the conduit is utilized in replacing the amount drawn from the stand pipe.

It is thus seen that the main office of the stand pipe is to satisfy the momentary deficiency in the capacity of the conduit, thus allowing the use of a much smaller conduit than would otherwise be practicable. It also prevents the sudden stoppage of flow in the conduit and thereby relieves it from sudden strains. With a conduit large enough to readily supply the greatest desired draught on the system, without decreasing the pressure beyond a fixed limit a stand pipe is not essential.

518 Fire Service.

In using steamers for fire pressure, the main question to be considered is the supply of water at the hydrants. In ordinary practice about 300 gallons per minute is required for a good fire stream. This is based on the discharge of a 1⅛ in. nozzle, with sufficient pressure at pump to overcome the friction of 100 feet 2½ in. hose and leaves 90 lbs. pressure at nozzle. Two such streams at least should be used at any fire. If the fire has gotten under headway four such streams should be used.

We can say then, that a fire will take from 300 to 1200 gallons per minute and in most cases will last less than an hour.

It frequently happens, however, that a fire will last for a much longer time. We will suppose a fire at the corner of Broad and 12th streets. The hydrants here have the advantage of a ten inch main and of being within a short distance of the stand pipe. Say the fire requires two streams taking an aggregate supply of 600 gallons per minute. Suppose when the fire begins the pressure is at 40 pounds, showing a domestic consumption of 632 gallons per minute, which added to the fire supply makes a total demand of 1232 gallons per minute. The water in the stand pipe has a depth of 92 feet, and it holds 2356 gallons for every foot of depth. During the first minute the conduit yields 632 gallons and the stand pipe 600 gallons. The stand pipe's surface will fall at the following rate: 3 feet in 12 minutes; 6 feet in 26 minutes; 9 feet in 39 minutes; 12 feet in 54 minutes; 15 feet in 71 minutes; 18 feet in 90 minutes.

At the end of 90 minutes from the beginning the conduit will be yielding 862 gallons and the stand pipe 370 gallons per minute, while the pressure will be down to 32 pounds at the base of the stand pipe, and still falling.

If four streams are used, making with the domestic supply, a total draught of 1832 gallons per minute, the stand pipe would fall

18 feet in 40 minutes; at the end of which time the pressure will be 32 pounds, the conduit will be bringing 852 gallons per minute into the city and the stand pipe will be furnishing 970 gallons per minute and still falling at the rate of nearly 5 inches per minute.

If this draught of 1832 gallons per minute were continued, a point finally would be reached where the supply from the stand pipe would become too small to make up the deficiency from the conduit. This point would be reached in 3 hours and 40 minutes from the
519 time of beginning, at the end of which time the water in the stand pipe would be only 9 feet and the pressure at its base only 3.9 pounds. From this instant it would be impossible to get the full supply of 1832 gallons, and the amount coming would constantly diminish until no water would come from the stand pipe to assist the conduit. As the ultimate capacity of the conduit with the full head of 117 feet is only 1495 gallons per minute it would be unable to supply the full amount called for. This is an extreme case, of course, and is given to show the limit of a domestic and fire supply, under the most favorable circumstance, where the fire is close to the stand pipe and has large mains to draw upon.

At a hydrant remotely situated and on a 4 inch main badly connected with the general system, another difficulty arises, viz: the friction on the mains leading from the stand pipe to the hydrant.

There are many locations in the city where water for two fire streams could not be supplied from a hydrant, even when there is 92 feet of water in the stand pipe. The conditions entering into a hydrant discharge, when water comes from several directions in pipes that are variously connected, are too complex for calculation. The velocities in the different pipes will be modified by so many causes that any attempt at an exact estimate of discharge will be useless.

In a properly laid system of mains the object aimed at is, first, to practically confine the greater part of the friction to pipe leading direct to the hydrant, and not over one block in length; second, to make this friction as small as economy will permit. The first object is attained by such connections as will bring the water from many pipes at once, thus making the current a minimum in each; the second is attained by using no mains too small to pass the desired minimum hydrant discharge with the pressure head available. As a matter of practice it has been found that 4 inch mains are entirely too small. Engineers everywhere condemn their use where fire protection is desired, and recommend 6 inch as a minimum.

The reason for this is apparent when we consider that in order to pass 300 gallons per minute through a four inch pipe a velocity of 7.65 feet per second is necessary, the friction of which will neutralize 5.58 feet of head for each 100 feet of pipe, and that 600 gallons per minute requires a velocity of 15.72 feet per second and makes a friction that neutralizes 20.4 feet of head per 100
520 feet of pipe. If a smooth straight 4 inch pipe 1648 feet long were attached to base of stand pipe, and allowed to flow from a free end, the discharge with a stand pipe head of 92 feet would be 300 gallons per minute. In order for the discharge to be 600 gallons per minute the length of the pipe could not be greater than 450 feet.

A hydrant at corner of Short and 9th Streets would have to contend with the friction on 1,000 feet of 4 inch dead-end pipe, in addition to some friction on other mains leading to it from stand pipe. It could not possibly supply two streams of 300 gallons each per minute.

A hydrant at corner of 3rd Avenue and 8th street could not supply two streams.

Plate III shows the present system of mains, an inspection of which will give you some idea of the amount of 4 inch pipe in use, and you can estimate the extent of the dependence placed upon it for fire service.

Plate IV shows a proper and complete system of mains.

Water for Rose Hill and North Highlands.

You have asked my opinion of the plan suggested, in a meeting of your general water works committee, by Mr. Swift, one of the members of that committee. No detailed statement of the plan has been given me, but as outlined to me verbally by you, the plan is to operate a pump by water power at the Eagle and Phenix Factory or the City Mills and fill a stand pipe on Rose Hill every night, the water being drawn from the present city supply, during the hours of the night in which there is the smallest demand for water in the city.*

This appears to me to be a good plan, and probably the most feasible, under all circumstances, for furnishing water to this part of the city, independently of any other consideration. Not knowing the population to be supplied, we estimate a supply of 50 gallons per capita for 2,200 persons, which will require 120,000 gallons per twenty-four hours. A stand pipe 20 feet in diameter and 60 feet high will hold 141,360 gallons, which is a surplus of 21,360 gallons for unusual emergencies.

The elevation of the territory to be supplied is about 90 feet above Broad street, or say 100 feet above the proposed location of pump. The maximum lift, then, would be 160 plus the friction head of the pipe used.

521 A pump with a capacity of 500 gallons per minute would deliver 120,000 gallons in four hours. If the pump were placed at City Mills the delivery pipe would be about 5,000 feet long, and the length from Eagle and Phenix would be about 7,000 feet.

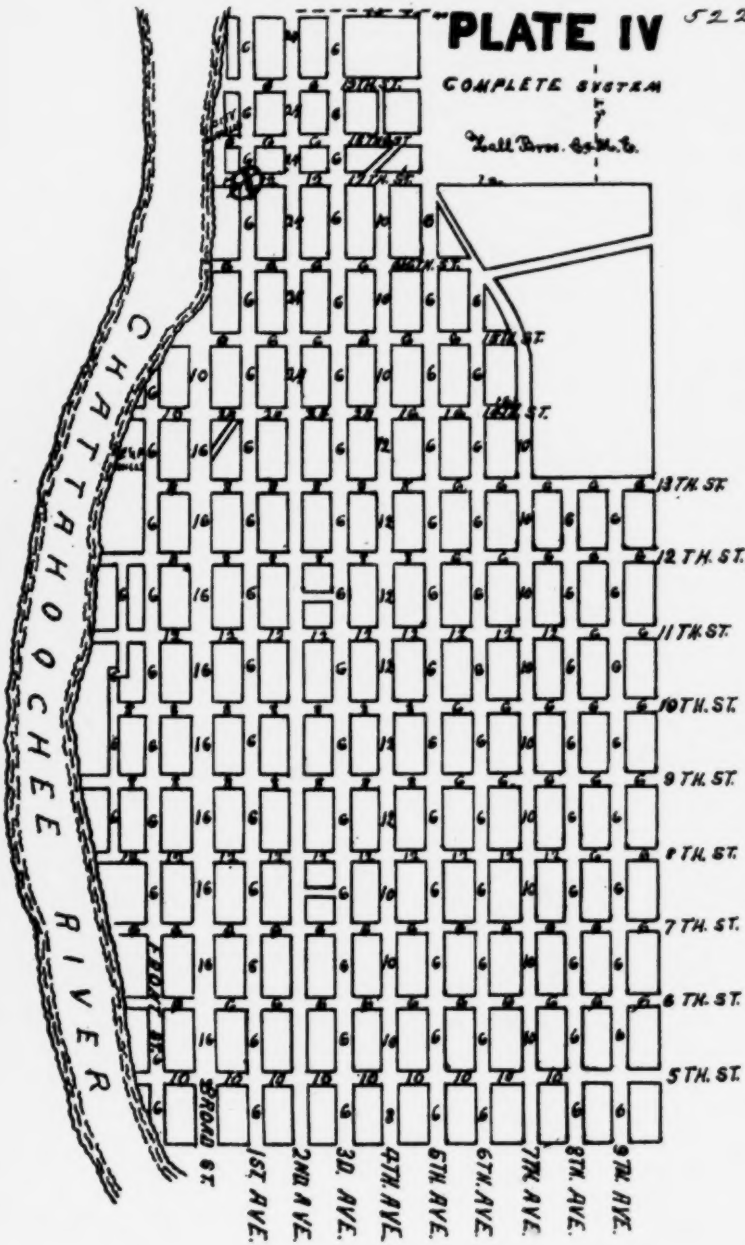
Placing the pump at City Mills and pumping through a 7 inch delivery pipe the friction head for a delivery of 500 gallons per minute would be 54 feet to be added to the 160 actual feet of actual head, making a total resistance equivalent to a head of 214 feet, which is a pressure of 93 pounds to the square inch against the pump pistons. The power required to do the pumping will be safely 36 H. P.

If the water were drawn from the mains with the best connection possible, at the time of night in which there is the least consumption in the city, say when the stand pipe is 104 the pressure is 45 pounds

* NOTE.—This is not Mr. Swift's plan at all.—J. J. Slade.

PLATE IV

COMPLETE SYSTEM



and the consumption or waste is 440 per minute, the 500 gallons per minute in addition would make a total draught of 940 gallons per minute. At first 440 of this would come from the conduit, and 500 from the standpipe, but as a great part of this 440 gallons is leakage induced by high pressure, it will naturally become less as the stand pipe falls and the pressure decreases. So that the conduit will probably be bringing enough water for the demands by the time the stand pipe level reaches a point somewhere between 75 and 80 feet, at which point it will cease to fall.

The 120,000 gallons can be pumped in six hours with the smaller pump and delivery pipe and less power per minute; the required delivery into the stand pipe being only 333⅓ gallons per minute. Twenty-four horse-power would do the work in this case. I think, however, that even with the six hour plan it would be better to have wheel and pump and pipe capable of 500 gallons per minute easy delivery.

Combined City Fire Service and Rose Hill Service.

We suggest the following modification of the Swift plan, as probably sufficient to meet present necessities:

1. Purchase power privilege from Eagle and Phenix or City Mills and put in water wheel and large power pump.
2. Tap present conduit between the present stand pipe and river, and lay a pipe line to pump suction.
3. Place a gate in present conduit directly to the east of this tap, so that all the water drawn will come directly from reservoir.

(Here follows plate IV, marked p. 522.)

4. Lay a delivery pipe from pump to Rose Hill, connecting
523 with Rose Hill mains, passing the stand pipe there and entering it by means of a branch with a gate in it, just as your present stand pipe is entered. This Rose Hill delivery pipe to also have a gate at its lower end near the pump.

5. Lay another discharge pipe from pump, connecting directly with the city mains and having a gate in it.

The best to use here will be a Gaskill water power pump, made by the Holley Manufacturing Co., and an engine and boiler should be placed there and kept in readiness to work the pump when the wheel is drowned in backwater.

Now, in using this plant for ordinary supply to Rose Hill, the operation would be just the same as in the Swift plan—all the gates being open except the one in the pump discharge entering the city mains.

In case of fire at Rose Hill, the gate in branch entering Rose Hill stand pipe could be closed and give better fire pressure.

In case of fire in the city, the gate in conduit near river, the gate in branch to city stand pipe and the gate at lower end of Rose Hill supply pipe would be closed, and the gate in pump discharge connecting with the city mains would be opened; the pump, running at increased speed, could then take water out of the conduit back of the gates and deliver it into the city mains under any fire pressure desired. By reference to Table No. 2, it will be seen that about 1,500 gallons per minute will be the limit of water available from conduit. If the fire occurs at the time the city is using 632 gallons per minute, which is the consumption when the stand pipe pressure is at 40 pounds, there would still be about 900 gallons per minute for fire, which would furnish three good streams. The advantage that this has over a gravity system lies in the fact that any desired pressure can be obtained and thus force an amount of water through a small pipe that would not go through it under any gravity head that is easily attainable. Its main disadvantage lies in operating expenses, which is largely compensated for in this instance by cheap power. Another disadvantage is the liability to burst the mains by sudden fluctuations of pressure. The greatest amount of work required by this pump would be to pump 1,500 gallons per minute under a pressure of 130 pounds per square inch, a lift of 300 feet, which would require a 142 H. P. wheel.

The items of expense entering into the installment of such a plant are:

524 1. A water wheel, 142 H. P., actual.

2. A Gaskill power pump, (Holly Mfg. Co., Lockport, N. Y.) capacity 1,500 gallons per minute against 300 feet head, (130 pounds) with gearing to water wheel.

3. A 142 H. P. engine and boiler to replace wheel in high water.

4. A 12 inch pipe from conduit to pump suction.

5. A 10 inch discharge pipe from pump to city mains, connected with enough smaller mains to give same area of water way.

6. A 7 inch delivery pipe from pump to Rose Hill.

7. One 12 inch gate, one 10 inch gate and two 7 inch gates. There is already one 12 inch gate in branch to city stand pipe.

8. A stand pipe at Rose Hill, 20 feet in diameter and 60 feet high, costing about five thousand dollars.

9. A system of mains and service pipes at Rose Hill and North Highlands.

The above data will enable you to get prices from dealers and manufacturers if you should wish to get cost of the plan. You will find elsewhere in this report the prices of cast and wrought iron pipe and cost of laying same.

The following is a list of questions sent me by your committee concerning present system, with my answers to the same:

Question 1. Is our present system of water works adequate to the present and growing demands of the city?

Answer. The city demands or needs a plentiful supply of water at a good pressure, not only on a level with Broad street, but in the upper stories of the highest buildings and in the highest portion of the city. The city needs a fire pressure of not less than 65 pounds in the business portion, and not less than 50 pounds in the higher residence portion.

The present system of water works does not satisfy these demands, and it is not adequate for the growing demands of the city.

Q. 2. What number of gallons per capita should be allowed?

A. I think Columbus should have 55 gallons per capita, at present, for all purposes, and as her population increases the proportion should be greater, say 60 gallons per capita when her population is 60,000. This estimate is on supposition that meters are used to prevent waste. Some cities of 30,000 population use more than 55 gallons and some considerably less. The amount used for manufacturing makes a great difference.

525 Q. 3. What pressure per square inch should we have for domestic pressure, and what for fire purposes?

A. For domestic pressure, not less than 40 pounds in the first stories of houses in the business section and thickly settled residence portions, and never less than 30 pounds in any part of the city where water is used at all.

For fire purposes, 65 to 90 pounds in business section. In an elevated residence portion, like Rose Hill, where it forms a comparatively small part of the whole city, a minimum fire pressure of 50 pounds can be safely adopted, with a prompt and efficient fire department.

Q. 4. What is the most feasible and practicable plan of supplying Rose Hill and Highlands with domestic and fire service?

A. As a temporary expedient, the Swift plan as above outlined is a good one for domestic pressure; a stand pipe would not do much good for fire service, unless it was a high one and kept full. If it is desired to let the rest of the city share in the advantage of a good fire pressure, the modification of the Swift plan, as suggested above, is probably the best.

Q. 5. What do you think of the Swift plan of connecting with

main near river bridge and pumping water into stand pipe on Rose Hill for Rose Hill supply?

A. I think the plan, or a modification of it, providing for fire pressure all over the city, when called for, is a good temporary expedient that will provide good service until a better general system can be built for the whole city. (NOTE.—See "Water for Rose Hill and North Highlands.")

Q. 6. Is our present system capable of supplying double hydrants? If not, why not?

A. It is capable of supplying double hydrants where the mains are not less than six inches and the connections are good. In many places it is not capable of doing so. (See discussion under head of "Fire Service.") This hydrant shortage is due to size and arrangement of mains in some portions of city.

Q. 7. What is the capacity of our present reservoir? And what amount of water do you find flowing into same now?

A. Upper reservoir, 39,392,000 gallons; lower reservoir, 12,078,000 gallons; total 51,470,000 gallons. On June 30th I measured the visible streams flowing into reservoirs, and found a flow equal to 730,000 gallons per twenty-four hours. Later on, July 24th, 526 Mr. Hudson's measure of visible streams shows a flow of 194,400 gallons per twenty-four hours. (See "Local Streams.")

Q. 8. Is 12 inch main sufficient for supplying city and keeping pressure at not less than 32 pounds when maximum amount of water is being used? What sized main would you recommend?

A. The maximum domestic consumption, shown by pressure taken at base of stand pipe July 31st, was 816 gallons per minute. The 12 inch main (called the conduit in this report) is of sufficient size to furnish this amount of water against a back pressure of 34 pounds per square inch on the level of Broad street, said back pressure holding the water in stand pipe at a head of 78⅓ feet. It is capable of delivering 862 gallons per minute, against a pressure of 32 pounds per square inch at Broad street level near stand pipe. But the maximum demand for water is during a fire, and the maximum demand during a fire depends upon the magnitude of the fire. Elsewhere in this report we have shown that the 40 pounds domestic supply and two fire streams, making a total draught of 1,232 gallons per minute, would bring the pressure at base of stand pipe from 40 pounds down to 32 pounds in ninety minutes, after which time the supply cannot continue without bringing the pressure below 32 pounds. We have also shown that with a demand of 1,200 pounds per minute for fire, and 632 gallons for domestic service, making a total draught of 1,832 gallons per minute, which is not an unreasonable demand when there is a large fire, the pressure would drop from 40 pounds to 32 pounds in forty minutes and would continue to fall rapidly. The ultimate capacity of the conduit with its full head of 117 feet from the reservoir and no pressure on Broad street, is 1,495 gallons per minute, while its capacity against a Broad street pressure of 32 pounds is only 862 gallons per minute. It is, therefore, evi-

dent that the 12 inch conduit is not sufficient for supplying the amount of water which should be at command during a fire, and at the same time keep up the pressure to 32 pounds at the base of stand pipe. The automatic register gauge at engine house, back of Rankin Hotel, shows for domestic service (at 8 A. M.) a minimum pressure of 25 pounds. The discrepancy between this and observed pressure at stand pipe, is partly due to friction on mains and service pipes near engine house. I would recommend an 18 inch pipe for this conduit. If it were 18 inches in diameter it would furnish
527 2,500 gallons per minute, against a Broad street pressure of 32 pounds. It would respond to a demand of 2,000 gallons per minute, with a permanent pressure of 37.7 pounds at stand pipe, and a steady head in stand pipe of 87 feet. With a domestic service of 720 gallons per minute, the pressure would be 48.6 pounds, and the stand pipe head 112 feet. If the 18 inch conduit were laid from the upper reservoir to stand pipe, it would furnish a domestic service of 720 gallons per minute, with a pressure of 53.8 pounds, and a head of 124 feet in the stand pipe, which is 4 feet higher than the present stand pipe.

Q. 9. Are mains in the city of sufficient size?

A. They are not.

Q. 10. What pressure would we get from a connection with the Stewart spring and mains below reservoir?

A. This plan, as I understand it, is to make a reservoir at the Stewart spring, to empound its water and lay a pipe line from this reservoir to the present conduit, connecting it by a tee, and having a gate valve in the spring pipe just before it enters the tee, and a check valve in the present line between the tee and the reservoir. Under ordinary conditions the spring pipe will be standing full of water, which will be held back by the gate, and water will be flowing in the conduit through the check valve and on to the city. When a fire alarm is given the gate is opened in the spring pipe and the check valve closes automatically and the whole pressure due to the spring head is given to the water in the city mains, the gate in the connection between the stand pipe and the city mains having been previously closed. The spring pipe to connect with the present conduit would be about 5,000 feet long, and will, in the following discussion, be considered as 12 inches in diameter. According to levels run both by Mr. Hudson and Mr. Beasley, the spring is about 280 feet above Broad street. This is sufficient to produce a hydrostatic pressure of 121.5 pounds per square inch, which would probably burst several of the mains, service pipes and connections in a system that has never been subjected to such a pressure. Not knowing the strength of the pipes used for the mains, I cannot say how disastrous the result would be. I shall presume in this discussion that they are standard pipe laid for fire pressure. When we speak of 121.5 pounds hydrostatic pressure, we mean the pressure that would exist if the water were standing and not running.

The available pressure for fire depends upon the velocity of
528 the current in the pipes, and this velocity depends upon the amount of water that is used both for fire and domestic serv-

ice. Placing the domestic service at 632 gallons per minute, and supposing a demand for two fire streams of 300 gallons each, the total draught on the spring reservoir would be 1,232 gallons per minute. The friction on the conduit and mains leading to a hydrant at the corner of Broad and Twelfth streets, will neutralize 117 feet of the total head, leaving an effective pressure head of 163 feet, and a pressure of 70.7 pounds. This is capable of doing very good fire service, but this is the most favorable location in the city, and this is with a supply of water, for fire, sufficient for only two streams. The outlook is not very promising for remote hydrants and small mains, nor for any location in the city demanding a supply for four or more streams at once. If it were necessary to have 1,200 gallons per minute for a fire at the corner of Broad and Twelfth streets in addition to the domestic supply of 632 gallons, making a total demand of 1,832 gallons per minute, the velocity of the current necessary to bring this supply would be 5.2 feet per second in the 12 inch conduit from Stewart spring to a point opposite stand pipe, and 6.2 feet per second for part going through the 10 inch main from end of conduit to corner of Broad and Twelfth streets. This great velocity would produce a friction in these pipes sufficient to neutralize 238 feet of the total 280 foot head, leaving an effective pressure head of 42 feet and a pressure of 18.2 pounds.

It will be seen from the foregoing that the trouble here arises not from any deficiency in elevation or water supply at the spring, but from the size of the conduit from spring to city. To demonstrate this we will suppose a conduit from spring to city 18 inches in diameter. This would bring 1,232 gallons per minute to the city, furnishing 632 gallons — domestic service and 600 gallons to fire hydrant at the corner of Broad and 12th streets, with a loss of head for friction of 21 feet, leaving a pressure head of 259 feet, and a pressure at the hydrant of 111.5 pounds. If 1,200 gallons were used for fire at the same hydrant and 632 gallons for domestic service, making a total outflow of 1,832 gallons per minute, the velocity of the current bringing this supply in the 18 inch conduit would be only 2.3 feet per second, and in the 10 inch main, from the end of conduit to hydrant, the velocity would be 6.2 feet per second. The friction from spring to hydrant would be sufficient to neutralize 45 feet of the total head, leaving an effective pressure head of 235 feet, and a pressure at the hydrant of 102 pounds.

529

I measured the flow of the Stewart spring on June 30th and found 36.6 gallons per minute=52,700 gallons per 24 hours.

On July 24th Mr. Hudson measured it again, finding that the flow had fallen off until it was only 22 gallons per minute, or 31,680 gals. per 24 hours. If a storage reservoir of 3,000,000 gals. capacity were constructed here and filled, the chances are that there would be no lack of water for fire service. The maximum draught would seldom be necessary, but even when it is required for so long a time as two hours at once, and takes 220,000 gallons out of the reservvoir the spring at the minimum observed flow will replace the water in seven days.

Starting with a 3,000,000 gals. reservoir full, a constant flow to the city of 1,832 gals. per minute would require 274 hours to exhaust it. Of course evaporation and leakage would tend to diminish the supply, but on the other hand the reservoir can be occasionally filled with rain water let in by a system of ditches leading from the water shed above.

In view of the above facts, I give it as my opinion that the plan as proposed would fail to furnish the city a fire service, because the conduit would be too small to furnish the necessary supply at the required pressure. It would require a larger conduit to give the service.

Q. 11. What additional pressure will the connection of main with upper reservoir give, and what additional elevation?

A. This extension is 1,800 feet long and the additional head gained is 13 feet. For domestic service the friction on this extension will neutralize from three to four ft. of the 13 ft. added. Hence, we will say in general that for domestic service the stand pipe head will be 83 feet where it is now 74 feet, and will be 102 feet where it is now 92 feet. Likewise the pressure on Broad street, near stand pipe, will be 36 pounds where it is now 32 pounds, and 44.3 pounds where it is now 40 pounds. This will have a corresponding effect on hydrant discharges. For example, a hydrant that discharges 580 gallons per minute under a stand pipe pressure of 40 pounds will discharge 618 gallons under a stand pipe pressure of 44.3 pounds. As the surface of upper reservoir is ten feet higher than the top of stand pipe it may be a wise precaution to provide an overflew notch in top of stand pipe, with pipe leading from it to gutter, capable of taking
337 gallons per minute. If the consumption is never less
530 than this there will be no outflow. A three inch pipe with funnel at the upper end will be ample.

Q. 12. What cost would make the present system meet the demands of the city as to fire pressure and supply for Rose Hill and Highlands?

A. Elsewhere in this report I have discussed this question fully under the head of "Combined City and Fire Service and Rose Hill Service," and proposed a modification of the Swift plan to meet the ends desired, in which are enumerated the items entering into the cost of plant.

Q. 13. What would it cost to duplicate the present system?

Ans. I estimate as follows:

Two reservoirs	$18,000
Stand pipe	10,000
20,000 feet 12 inch pipe at $1.05 laid	21,000
3,700 feet 10 inch pipe at 85c. laid	3,145
7,900 feet 8 inch pipe at 65c. laid	5,135
30,500 feet 6 inch pipe at 51c. laid	15,555
24,500 feet 4 inch pipe at 36c. laid	9,920

Special for above mains	355
1,800 feet of 12 inch extension at $1.05	1,890
	$85,000
Allowance for 18 inch pipe across the river, service pipe, meters, land for reservoir, etc., and for engineering and contingencies	35,000
Total	$120,000

Q. 14. What effect does the rainfall have in mixing with the stored water? Will the decaying vegetation have the effect of contaminating the water?

Ans. On such a water shed as this there is no danger of pollution from vegetation, and there is no present danger of animal pollution. If the water shed should become densely populated there would be serious danger of pollution from animal matter. The safest thing for a city to do is to purchase the entire water shed from which her supply comes. By doing this and allowing it to reclothe itself with forest the water will always be pure and clean, and the supply will be more uniform.

A city could not possibly make a better investment.

Proposed New Systems—At

1. Chattahoochee Falls property.
2. Geo. M. Clapp property.
3. Lover's Leap.
4. Eagle and Phenix or City Mills.

The first two of these locations are in the same vicinity and are chosen with reference to the same general plan, which is to pump the empounded water of Roaring creek by water power into a reservoir on a high hill from which it can be conveyed by gravity to the city in a large pipe under a high pressure.

(Here follows Plate I, marked p. 531.)

CHARTS

TOO

LARGE

FOR

FILMING

532 The third is a location nearer the city from which the water of Roaring creek or the Chattahoochee river could be pumped by water power under direct pressure from the pump without an intervening reservoir.

The fourth is a location in the city for direct pumping.

Plate I is a general map of the entire territory north and west of Columbus, showing the streams furnishing the present water supply, and also those from which a new and separate supply can be obtained. In considering the subject of a new and separate system, naturally the first question that arises is the source from which the water is to be drawn. By reference to Plate I it will be seen that Roaring creek is admirably situated for furnishing this supply and that it has the further advantage of being near Standing Boy creek, from which an additional supply can be drawn whenever the necessity arises.

Roaring Creek.

Roaring creek already spoken of under the head of "Local Streams" is a stream peculiarly suitable for furnishing a supply of good water of the same quality as the present supply.

Its water shed is of the same geological age and the same general formation as that of Holland's creek, a thin deposit of cretaceous clay, sand and gravel lying unconformably upon an uneven Archæan bed-rock. The surface contains very little soluble coloring matter, and as a consequence the stream is clear except in violent rain storms. Even then the muddiness of the water is caused by the coarse sandy clay of this younger formation which settles quickly in a reservoir and leaves the water clear. In this respect it differs materially from the red clay of middle and northeast Georgia, which is formed by the decomposition of granite rocks. These remarks apply equally to the water sheds of Holland's creek and east Standing Boy creek.

Roaring creek is formed by two widely divergent streams which come together on the farm of Mr. Geo. M. Clapp a short distance from the river and at the top of a precipitous shoal, from which point the water falls 33 feet before entering the river. The divergence of the two streams makes a very wide flat basin formed by
533 nature for an empounding reservoir, and at the top of the shoal the hills on each side shut in very close together, making it easy to form an immense lake, by the construction of a short dam. I made survey for dam, cross-sectioned the entire area that can be covered by water into two hundred foot squares, and took levels to get depth of water at all points. Plate V shows the dam and reservoir.

The reservoir will cover 121 acres, have a maximum depth of 31 feet, and average depth of 14.7 feet, and a capacity of 580,000,000 gallons.

The surface of water in this empounding reservoir will be 64 feet above the river at mouth of creek, and 117 feet above Broad street.

The dam will be 39 feet high at the deepest point, 700 feet long on top, constructed of earth 30 feet wide on top, inner slope 2½ to

1 riprapped, outter slope 1½ to 1 sodded, 4 foot retaining wall at foot of outer slope. Besides the dam proper a gap in the ridge near the north end will require an embankment 10 feet high at its deepest point. At the end of this embankment a spillway 150 feet long to be placed, with flash board 18 inches high which can be let down if desired. The entire dam including embankment in gap, will contain 50,000 yards of rolled earth embankment. The river road to be on top of dam.

The water shed of Roaring creek above the proposed dam is 4,056 acres, or 6.33 square miles. One inch of rain fall on this water shed will yield 110,140,680 gallons of water. Now, making due allowance for evaporation and leakage, one-half of this water can be empounded and made available as a city supply, which will amount to 55,000,000 gallons for each inch of rain fall over the water shed.

The following table, No. 3, shows how a 6,000,000 gallon supply can be obtained from Roaring creek, the rain fall used being taken from observations of Columbus rain fall furnished me by the U. S. Weather Bureau. The three autumn months taken from 1891, the dryest three months period in ten years, the rest from average of ten years' observations. This table shows a minimum surplus in reservoir of 89,000,000 gallons.

534 *Table Number Three.*

6,000,000 gallons supply from Roaring creek water shed, 4,056 acres. Capacity of reservoir 580,000,000 gallons.

Month.	Inches of rainfall.	Storage for month in million gallons.	Water in res'voir in million gallons.	Million gallons used in month.	Million gallons surplus.	Million gallons overflow.
December	.....	.....	.....	.....	206 0	.....
January	4.14	227.7	433.7	186	247.7	.....
February	5.1	280.5	528.2	168	360.2	.....
March	7.29	400.9	580.0	186	394.0	181.1
April	1.94	106.7	500.7	180	320.7	.....
May	2 97	163.3	484.0	186	298.0	.....
June	4.43	243.6	541.6	180	361.6	.....
July	6.09	235.0	580.0	186	394.0	116 6
August	5.30	291.5	580.0	186	394.0	105.5
September	1.11	61.0	455.0	180	275.0	.....
October	00.00	00.0	275.0	186	89.0	.....
November	4.29	236.0	325.00	180	145.0	.....
December	4.49	247.0	392.0	186	206.0	.....

I consider the above estimate a very safe one, because the time that there is the greatest danger of a shortage is in the autumn, and I have put opposite these months, not the average rain fall, but that of the dryest season in the last ten years. An additional element of safety is the large minimum surplus in reservoir.

6. That the net earnings of said defendant company for the year ending December 31, 1902, was more than the sum of twenty eight thousand dollars.

7. That the only lien now existing against the property of said defendant company is a first mortgage deed of trust made and executed by this company to the Mercantile Trust & Deposit Company, of Baltimore, Maryland, Trustee, to secure an issue of $500,000.00 of bonds, $400,000 of which have been issued, of which latter $8000.00 are now in the treasury of said company, leaving an outstanding bonded indebtedness of $392,000.00.

8. That a large majority of the bondholders of said company have entered into an agreement, depositing their bonds with the Mercantile Trust & Deposit Company, Trustee, and appointing Fred'k M. Colston, Julian T. Burke, John A. Whitridge, Nathaniel W. James and Miles White, Jr., a committee, to act for said bondholders in protecting and enforcing the rights of said bondholders; and to institute or become parties to any legal proceedings which such bondholders could institute or become parties to.

Wherefore, your petitioner prays that said Mercantile Trust & Deposit Company, of Baltimore, Trustee for said bondholders, be made a party to this petition, and also said Bondholders' Committee, and that said trustee and each of the members of said Bondholders' Committee be served with this petition.

That an order be granted authorizing your petitioner to execute and sell an issue of receiver's certificates not exceeding one hundred and fifty thousand dollars, payable within five years, bearing interest at a rate not exceeding six per cent. per annum, payable semi-annually; but to be redeemable, at any time, out of the earnings of the said company, as the same may be found sufficient; said certificates to be issued as it may be necessary to pay for said work and construction, as the same progresses, but with the approval
11 of the bondholders' committee above mentioned, or a majority of them; and said certificates to be a first lien on all of the property of said company, now owned or hereafter acquired.

That out of the proceeds of said sale of receiver's certificates, your petitioner be authorized to lay mains, pipes, etc., build filter plants, reservoirs, and improve generally the waterworks system of said company; and to do any and all things that may be necessary and proper for the prompt and efficient execution of said work and improvements.

And your petitioner will ever pray, etc.

W. S. GREENE, *Receiver.*

LOUIS F. GARRARD,
Att'y for Receiver.

UNITED STATES OF AMERICA,
State of Georgia, County of Muscogee:

In person appeared before the undersigned, William S. Greene, who, being duly sworn, deposes and says, that he is the Receiver of the Columbus Water Works Company, duly appointed by order of

the United States Circuit Court; that he is the petitioner named in the foregoing petition; that he has read the said petition; and that the facts set forth therein are true.

W. S. GREENE.

Sworn to and subscribed before me this the 4th day of March, 1903.

[SEAL N. P.] A. W. HALE,
Notary Public, Muscogee County, Georgia.

Due and legal service of the foregoing petition is acknowledged, and all other and further service thereof is waived.

L. F. GARRARD,
Attorney for Columbus Water Works Co.
H. H. EPPING,
Prest. Columbus Water Works Co.

12 In the Circuit Court of the United States for the Northern District of Georgia, Western Division.

In Equity. No. 57.

THE MERCANTILE TRUST AND DEPOSIT COMPANY OF BALTIMORE, Trustee,
v.
THE COLUMBUS WATER WORKS COMPANY.

To the Honorable the Judges of said Court:

The Mercantile Trust and Deposit Company of Baltimore hereby acknowledges service of the petition of William S. Greene, receiver in this cause, praying for the issue of not more than one hundred and fifty thousand of six per cent. Receivers' Certificates of the tenor therein mentioned, to be a first lien upon the property of the Columbus Water Works Company.

This company, the plaintiff in this cause, believes the allegations of fact in the said petition to be true, and states to the court that at this date there have been deposited with it, under the bondholders agreement mentioned in paragraph 7 of said petition, three hundred and thirty seven bonds ($337,000) of the Columbus Water Works Company therein referred to, and it submits to such decree or order in the premises as to the court shall seem proper.

MERCANTILE TRUST & DEPOSIT CO. OF BALTIMORE.
By JOHN GILL, *Prest.*

Attest:
[SEAL.] J. P. WALKER, *Secretary.*

JOSEPH PACKARD,
Solicitor for the Mercantile Trust and Deposit Company.

March 2, 1903.

13 In the Circuit Court of the United States for the Northern District of Georgia, Western Division.

In Equity. No. 57.

THE MERCANTILE TRUST AND DEPOSIT COMPANY OF BALTIMORE, Trustee,
v.
THE COLUMBUS WATER WORKS COMPANY.

To the Honorable the Judges of said Court:

The undersigned, Frederick M. Colston, Julian T. Burke, John A. Whitridge, Nathaniel W. James and Miles White, Jr., a committee of the bondholders of the Columbus Water Works Company under an agreement, a copy of which is hereto annexed, hereby acknowledge service of the petition of William S. Greene, receiver in this cause, praying for the issue of not more than one hundred and fifty thousand of six per cent. Receiver's Certificates of the tenor therein mentioned, to be a first lien upon the property of the Columbus Water Works Company.

These respondents for themselves and for their constituents, the bondholders aforesaid, admit the allegations of fact in the said petition to be true, and consent to the passage of an order authorizing the issue of such Receiver's Certificates as prayed in said petition.

FREDERICK M. COLSTON,
JULIAN T. BURKE,
JOHN A. WHITRIDGE,
NATHANIEL W. JAMES,
MILES WHITE, JR.,
Committee of the Bondholders of the Columbus Water Works Company.

JOSEPH PACKARD,
Solicitor for the above-named Respondents.

Filed in clerk's office 13 March, 1903.
O. C. FULLER, *Clerk*,
By N. A. BROWN, *Deputy*.

14 *Order for Issuance of Receiver's Certificates.*

In the Circuit Court of the United States for the Northern District of Georgia, Western Division.

In Equity. No. 57.

MERCANTILE TRUST & DEPOSIT CO., Trustee,
v.
COLUMBUS WATER WORKS COMPANY.

Now, on this 7th day of March, 1903, comes on to be heard the matter of the petition of the Receiver William S. Greene, heretofore

appointed in this cause, asking authority to issue Receiver's Certificates to the amount of one hundred and fifty thousand dollars, which shall have a lien prior to all others of the property, rights and franchises of said company, now in existence or hereafter to be acquired, which are in said petition; and come again the parties, by their solicitors, and the receiver, and the court having heard from the receiver, and from the various parties at interest, towit, the Mercantile Trust & Deposit Company, Trustee, and from Frederick M. Colston, Julian T. Burke, John A. Whitridge, Nathaniel W. James, and Miles White, Jr., a committee appointed and named in the bondholders' agreement, to act for said bondholders, in protecting and enforcing the rights of said bondholders and to institute and become parties to any legal proceedings which said bondholders could institute or become parties to; and the court having before it the acknowledgment of service and answer of the said Mercantile Trust & Deposit Company, of Baltimore and said Committee of Bondholders; and the defendant company.

And it appearing to the court that the allegations in said petition with reference to the necessity for an immediate improvement of the property in the hands of the receiver, are true, and for the preservation and best interests of the property in the custody of the court, and to enable the receiver in order to preserve the property
15 and the interest of the company and its creditors in carrying out the contract existing between the Columbus Water Works Company and the City of Columbus, and to perform a grave public duty owing to said City of Columbus, and in the performance of which it is necessary that a considerable sum of money be expended as stated in the petition of the receiver, and no cause being shown against the same, it is therefore by the court

Ordered and decreed as follows: That William S. Greene, receiver heretofore appointed in this cause, and his successors in office, be and they are hereby fully authorized and instructed, on the terms and conditions hereinafter stated, to execute and issue certificates of indebtedness as such receiver, to an amount not exceeding fifty thousand dollars, to be dated on the first day of April, 1903, payable five years thereafter, bearing interest from date at the rate of six per cent. payable semi-annually, at the office of the Mercantile Trust & Deposit Company, of Baltimore, or elsewhere, as shall be expressed in said certificates; said certificates may be redeemable at any time, out of the earnings of said company, as the same may be found sufficient; said certificates to be issued as may be necessary to pay for said work and construction, as the same progresses. The indebtedness created and evidenced by the receiver's certificates issued under this order is hereby constituted and decreed to be, and so to continue, until fully paid off and satisfied, a paramount lien, upon all and singular the property and assets of the Columbus Water Works Company, now or hereafter acquired, and the proceeds thereof, and the net income therefrom.

The certificates so to be issued shall bear a serial number and be substantially in the form following:

Columbus Water Works Company.

Receiver's Certificate of Indebtedness Secured on all Properties of the said Columbus Water Works Company.

No. —. $—.

16 This is to certify that William S. Greene, Receiver of the Columbus Water Works Company, (as such receiver, and not individually) is indebted to —— or bearer hereof, in the sum of $—, payable in gold coin of the United States, of the present standard of weight and fineness, on the — day of ——, 1908, at the office of —— in —; and interest thereon from date, until paid, at the rate of six per cent. per annum, payable semi-annually in like gold coin, on the first days of October and April, of each year, at the same place, on presentation of this certificate, for the endorsement of such interest payment thereon. This certificate is redeemable on any interest day, at the option of the Receiver, or of the Court, by a notice published once a week for four weeks; said notice being published in two daily newspapers, one of which shall be located in the City of Columbus, Georgia, and the other in the City of Baltimore, Md., and interest hereon will cease on the date fixed in such notice. This certificate is one of a series of like tenor and effect, issued by said Receiver, under the order of the Circuit Court of the United States for the Northern District of Georgia, Western Division, entered on the — day of ——, 1903, in the cause therein pending in equity, wherein the Mercantile Trust & Deposit Company, of Baltimore, Trustee, is complainant, and the Columbus Water Works Company is the defendant, by which order the said Receiver was authorized and instructed to execute and issue certificates of indebtedness as Receiver, to an amount not exceeding fifty thousand dollars, for the purposes and on the security therein mentioned; the Court expressly reserving the right to increase the issue of receiver's certificates in this case to one hundred and fifty thousand dollars, and the right to give the additional one hundred thousand dollars the same lien and the same rank as to priority of payment on all of the property of the Columbus Water Works Company in the hands, or which may hereafter come into the hands, of the Receiver, as the said fifty thousand dollars now authorized, shall have; and the court now so expressly provides in the event
17 said reserved rights should be exercised.

The Receiver is in no way individually liable upon this certificate, but under the decree of said Court, the certificates of this series constitute, until paid, a paramount lien and charge upon all and singular the property and assets of the Columbus Water Works Company, now in the hands of said Receiver, the proceeds thereof, the net income therefrom, including all property of said company now in the possession of said Receiver, and all property which may hereafter be acquired, either by said company or by said Receiver.

This certificate shall not be valid until the certificate hereon has been signed by Frederick M. Colston, Julian T. Burke, John A.

Whitridge, Nathaniel W. James and Mile White, Jr., committee of bondholders, or a majority of them.

In Witness Whereof, the said Receiver has signed this certificate on the — day of ——, 1903.

To said certificates or any of them, there may be attached interest warrants, corresponding to the respective semi-annual payments of interest, substantially in the following form:

Columbus Water Works Company.

Receiver's Certificates on Property of said Company.

No. —.

Interest warrant for — dollars, payable in gold coin, at the office of —— on the — day of —— 190–.

$—.

——— ———,
Treasurer for Receiver.

The Receiver shall preserve a proper record showing the serial number, payee, and the amount of each such certificate, and shall report the same to the court. Such certificates may be applied by the Receiver directly to the settlement of the indebtedness incurred in making the improvements herein ordered, and to effect the purchases hereinafter mentioned, or may be sold by the Receiver and the proceeds so applied. None of said certificates shall be sold at a less rate than par, for a certificate bearing six per cent. interest; but the same may be disposed of at not less than said rate from time to time, as the Receiver may deem necessary to meet the requirements of this order.

18

The fund realized from the sale of said certificates shall constitute a special fund and shall be separately deposited, held and used by the Receiver exclusively for the purposes following, towit: To pay and discharge indebtedness of the Receiver of the Columbus Water Works Company, now incurred or hereafter to be incurred, not exceeding the sum of fifty thousand dollars, with six per cent. interest thereon, for money expended or to be expended, in building reservoirs, laying mains, pipes etc., building filter plants, storeage reservoirs, and improving generally the water works system of the said Columbus Water Works Company, and in doing any and all things that may be necessary and proper for the prompt and efficient execution of said work and improvements.

This the 7th day of March, 1903.

WM. T. NEWMAN,
United States Judge.

Filed in clerk's office 13 March, 1903.

O. C. FULLER, *Clerk.*
By N. A. BROWN, *Deputy.*

19 *Application of Receiver for Authority to Extend Intake Pipe.*

U. S. Circuit Court, Western Division, Northern District of Ga.

In Equity. No. 57. Foreclosure.

MERCANTILE TRUST & DEPOSIT CO. OF BALTIMORE, MD.,
v.
COLUMBUS WATER WORKS CO.

To His Honor, Wm. T. Newman, Judge:

This report of the Receiver of the Columbus Water Works Company is to show the physical status of the property placed in his hands, and the progress made towards carrying out the orders and instructions of the court.

1st. The water from Dinglewood Spring on Wynns' Hill was on July 9th, 1904, piped from a cistern built just below the spring, and holding 5,000 gallons to 12th street, and down 12th street to its intersection at Broad street; at each street crossing, seven in number, there has been placed a faucet, from which free drinking water is gathered daily by the citizens. This work cost about $1,500. The cistern is always overflowing, despite the quantity drawn from it.

2nd. Regarding the instruction to connect the 17th street Filter Station with the Bibb Mill pond above their dam, the following progress has been made.

Chemical and bacteriological analyses of the water taken from point proposed as intake for this pipe line has been made by the State Chemist, Dr. Jas. M. McCandless, which analyses are in the hands of the Special Master, Hon. H. R. Goetchius. These analyses show a perfectly pure water.

A survey has been made of the route of the proposed line of pipe from 17th street to Bibb Mill, and an agent is now procuring right of way along said route.

The bondholders have signified their willingness to allow the Receiver to install the pipe to Bibb Mill, provided the Receiver
20 can pay for same by his notes, in lieu of certificates pledging the income of the property and using same to pay off said notes. This consent of the bondholders is hereto attached.

The American Spiral Pipe Company has agreed to let the Receiver have the 12 inch pipe necessary at 90c per foot and take four notes at 6% payable quarterly. This pipe will cost (7600 feet at 90c) $6,840, fittings $660.00—$7,500, hence each note would be for $1,875. This price covers delivery at Columbus, Georgia. Dynamo, pump and laying pipe about $2,500 more, making total cost $10,000. The extra $2,500 can be cared for out of the income also, but without notes.

3rd. The present net income from the property is about $16,000 per annum.

4th. The late rains have filled the reservoir to within 2½ feet of the top of the dam, being a rise of 5½ feet since the visit of the Court to the site. They will soon be ready for use, as the flow of the stream

into the pond is normal, and in a few days I expect to use only reservoir water.

5th. If it is still deemed necessary to install the pipe line from 17th street filter station to Bibb Mill pond, I would respectfully ask to be allowed to pay for the pipe by issuance of Receiver's notes bearing 6% interest till paid.

The time necessary to install this pipe will be about sixty days, depending on the delivery of the pipe, so that by October 15th at farthest, the line would be in working order. The court of course must decide as to the necessity for this line now. As when installed, it will only give river water, and perhaps not one more person would use the water than are now doing so. The plant now supplies one million gallons daily, which is all the city consumes for all purposes, but can supply one and three-fourth (1¾) millions of clear sparkling water, which by boiling is suitable for all domestic purposes, including drinking, and the Dinglewood pipe line supplies free pure water to all who choose to use it. There can be therefore no dearth
21 of supply even in the months of October and November, should they be dry.

Awaiting the further instructions of the Honorable Court.

Respectfully submitted,

W. S. GREENE,
Receiver Col. Water Wks. Co.

Columbus, Ga., Aug. 13, 1904.

Columbus (Ga.) Water Works Company Bondholders' Committee.

BALTIMORE, *July 7th,* 1904.

Major W. S. Greene, Receiver, Columbus, Georgia.

DEAR SIR: The Committee met to day and had before it the various documents and letters from Mr. Garrard, from Mr. A. E. Boardman and from yourself, from June 28th to and including July 5th.

The lease of the Dinglewood Springs and the work in connection therewith, having been ordered by the Court, is approved.

In regard to the extension to the dam of the Bibb Manufacturing Company, the Committee approves of that work and authorizes you to contract for it, with the condition that you can provide the means therefor, which the Committee thinks you ought to be able to do by the issuance of your notes, for which the whole net income of the company can be pledged until these notes are paid.

You can offer those notes in payment of the pipe and, with such assistance as the local banks can give you for your pay-rolls, you can secure sufficient funds to do the work and carry on the regular operations of the company at the same time.

In regard to the execution of this work and the advantage of going to the Bibb Company, the contract with that company, etc., the Committee leaves those matters entirely to your judgment and experience and that of Mr. Boardman, our engineer, the Committee not being able to decide these questions at this distance and with the information before them.

Yours truly,

(Signed) FREDERICK M. COLSTON,
Chairman.

22 U. S. Circuit Court, Western Div., Northern District of Ga.

In Equity. No. 57.

MERCANTILE TRUST AND DEPOSIT CO. OF BALTIMORE, MD.,
v.
COLUMBUS WATER WORKS CO.

Foreclosure.

To His Honor Wm. T. Newman, Judge:

This report is made as an ad-enda to the report of the Receiver made Aug. 13th, 1904. Since which report a more careful inspection has been made of the reservoirs, and the Receiver is satisfied of the necessity for the installing of the pipe line from 17th street to the Bibb Mill dam. A survey made along the line of the proposed pipe makes the distance 7800 feet and increases totaf cost of the pipe. I would therefore respectfully ask for authority to pay for this pipe by the issuance of Receiver's notes, bearing 6% interest, until paid,—to be issued in 4 notes of $2000 each payable quarterly, or so much as may be necessary.

Respectfully submitted,
August 23, 1904.

W. S. GREENE,
Receiver Col. Water W'ks Co.

Filed in clerk's office 24 Aug. 1904.

O. C. FULLER, *Clerk,*
By N. A. BROWN, *Deputy.*

Order of Reference.

The within is referred to Henry R. Goetchius, Esq., Standing Master, for immediate investigation and report.

WM. T. NEWMAN,
U. S. Judge.

Filed in clerk's office 24 Aug. 1904.

O. C. FULLER, *Clerk,*
By N. A. BROWN, *Deputy.*

23 *Special Report of Master.*

U. S. Circuit Court, Western Division, Northern District of Georgia.

In Equity. No. 57.

MERCANTILE TRUST & DEPOSIT CO. OF BALTIMORE, MD.,
v.
COLUMBUS WATER WORKS COMPANY.

Foreclosure.

To His Honor Judge Wm. T. Newman:

In the Matter of the report of W. S. Greene, Receiver of the Columbus Water Works Company, of date August 13th, 1904, with reference to extension of water main for intake from the Chattahoochee river at Bibb Mill pond, referred to me by your Honor with instructions to immediately investigate and report, I beg to submit the following:

On August 19th instant I visited the reservoirs of the Company in Alabama in company with the Receiver and made careful inspection of the same and have also made other investigation as to conditions of the water supply of the City. I find as follows:

1st. The lower reservoir of the works is practically empty and in no condition to furnish water for the city.

2nd. The upper reservoir is gradually being filled. The water is running in from the two sources of supply, the north and east prongs of the creek, in very moderate quantities, and the upper or storage reservoir is filling slowly. The water now registers approximately within three feet of the dam and within six feet of the top of the flash boards. The surface of the pond is about one third covered. The inflow with the present conditions of the supply streams will in due course of time fill the upper reservoir, but this will have to be accomplished before the lower reservoir can be supplied.

3rd. I find by enquiring of the United States Government officer at Columbus in charge of the rainfall record that the average annual rainfall for this section is 54 inches; that the rainfall to the
24 date August 18th, 1904, is 26.48 inches, leaving to be supplied by January 1st, 1905, 27.52 inches. The average rainfall for this immediate section of country for fifteen years past is as follows for the remaining months of the year, towit:

August, (last half)	3.01	inches.
September	2.34	"
October	2.67	"
November	2.54	"
December	3.48	"
Total	14.04	inches.

These figures are taken from a publication purporting to be given out by the head of the Georgia Experimental Station. The shortage this year being 27.52 inches as above stated, and the average expectancy being 14.04 inches as above stated the amount of rainfall for the next sixty or ninety days will be purely speculative, and therefore it cannot be said as to how soon the reservoirs will be filled. When that event occurs it doubtless would be well to have the distribution mains of the Water Works system thoroughly flushed and the first fillings of the reservoirs emptied as they have become more or less fouled, and especially the upper one by reason of the long drought. This will entail further delay. I therefore conclude that the present condition of the reservoirs and the uncertainty as to when they can be utilized suggests a dismissal of this source of supply from consideration in determining the question submitted.

4th. I find that the pipe recently installed by the Receiver on Twelfth street from Dinglewood Spring furnishes a daily supply of pure drinking water to such of the citizens as desire to use it. The extent of the supply is about 8000 gallons daily, which would allow about one gallon each to the estimated water users of Columbus. There are 1583 water takers and allowing five to the family there would be 7915 persons (or in round numbers 8000) to be supplied. This pipe is a convenience to the people in the immediate vicinity thereof and to such persons as are able to send and get the water. It runs through a central street of the old city. Water vendors also purvey drinking water and many people rely on wells and cisterns. I am satisfied a considerable percentage of the people, especially among the more humble classes, use the filtered river water furnished by the Receiver. Some few people may boil it as directed, others possibly do not. The water is clear and apparently all right, but the analysis of the State Chemist showed to the contrary. The conditions now and in the drought of 1902 when the river was the only source of supply differ in that at that time the water was unfiltered and the foul and muddy appearance of the water was a standing notice to the people not to use it. Such is not now the case, and there is to the ignorant a temptation to use it.

5th. The Receiver is now furnishing clear filtered water through his plant. It is sufficient for fire protection and for street and lawn sprinkling. It is used for laundry and to some extent for bathing, and as above stated for drinking by a good many people. The water, under the analysis as above referred to, is a bad water, and the known contamination of Cook's branch and the 18th and 26th street sewers, and the sewage inflow from Hibb City, and the City Mills closets all combine to make it extremely objectionable. It is impossible to tell what harm may result from its use. There is not, so far as I can ascertain, any pronounced cases of sickness in the City attributable to the water, but the evidence of experts submitted before me in the case of the Trust Company *v.* The City, in Equity No. 59, showed that poison from bad water could be slowly injected into the human system and produce numbers of ills and place the system in such condition to easily succumb to disease.

6th. If the water be taken by the Receiver from Bibb Mill pond

it will be above the sewer contamination referred to. While only
few additional water takers may be added to the present consumer
of river water by taking water at this pond, there is possibility tha
not so much harm may result from its use to those now con
26 suming the river water. The analyses of the State Chemis
of file with me show the unfiltered river water above Bibb mil
dam to be bad, and the same water filtered at Bibb Mill by its filte
to be suitable for domestic purposes. The filter of the Receiver i
presumably as effective as the Bibb Mill filter and the water of Bibl
Mill pond or above filtered by the Receiver will doubtless be bette
than the present supply—if for no other reason, because it will have
been subjected to less chance of contamination.

7th. Whatever be the outcome of the present litigation it is pre-
sumed that there will be the usual delay to final conclusion and in
the meantime the people must look to the Receiver for the water
supply.

In view of the foregoing facts I conclude that it would be wise to
allow the Receiver to discontinue, as soon as possible, the use of the
present intakes below Bibb Mill pond and install an intake at said
pond as described in his said report. I conclude that the matter of
expense named by him is of secondary consideration in view of the
conditions of the present source of supply, and I therefore recom-
mend to your Honor that the Receiver be allowed to make the im-
provements as suggested.

This August 20th, 1904.

Respectfully submitted,

HENRY R. GOETCHIUS,
Master in Chancery.

Filed in clerk's office 24 Aug. 1904.

O. C. FULLER, *Clerk*,
By N. A. BROWN, *Deputy*.

27 *Order Authorizing Receiver to Extend Intake Pipe.*

In the United States Circuit Court, Northern District of Georgia,
Western Division.

In Equity. No. 57.

MERCANTILE TRUST & DEPOSIT COMPANY OF BALTIMORE, MD.,
v.
COLUMBUS WATER WORKS COMPANY.

On petition and supplementary petition of W. S. Greene, Re-
ceiver in the above stated case, in reference to the connection of the
filter plant at 17th street with the Bibb pond above the Bibb Mill
dam—the same having been referred to Henry R. Goetchius, Master
in Chancery, for investigation, and his report filed herewith being
favorable to said work:

It is ordered that W. S. Greene, Receiver, is hereby authorized to proceed at once with said work and is directed to complete the same at the earliest date practicable. He is authorized to purchase the necessary pipe and to give his notes as Receiver as suggested by him for $2000.00 each payable quarterly, or for so much as may be necessary. Said notes to be paid from the net income of the Water Works and to be a charge on said net income.

This Aug. 23d, 1904.

WM. T. NEWMAN,
U. S. Judge.

Filed in clerk's office 24 Aug. 1904.

O. C. FULLER, *Clerk,*
By N. A. BROWN, *Deputy.*

28 *Petition to Dissolve Injunction Pendente Lite.*

In Equity. In the Circuit Court of the United States for the Northern District of Georgia, Western Division.

Bill. No. 59.

MERCANTILE TRUST & DEPOSIT COMPANY OF BALTIMORE
v.
CITY OF COLUMBUS ET AL.

To the Honorable the Judges of said Court:

The petition of the City of Columbus, one of the defendants named in the above entitled cause, respectfully represents unto the court as follows:

1st. That heretofore, to wit, on the — day of ——, 1903, the court granted an injunction *pendente lite*, restraining this defendant from constructing or proceeding to construct a system of waterworks in and for said city pending the adjudication of the cause, and entered an order of reference to the standing master to hear and report the cause on all the issues of law and fact involved.

2nd. That subsequently during the months of February and March, 1904, the evidence was taken before the master, but by reason of the large volume of the evidence the same was not written out until quite recently by the reporter, so that the case has not yet been argued before or considered by the master.

3rd. That since the granting of said injunction and the reference of the cause and the taking of the evidence before the master conditions have materially changed in that the reservoirs in Alabama have again failed and the same have been temporarily abandoned as a source of water supply; and that the entire supply of water is now being taken from the Chattahoochee river at a point within the city of Columbus near the foot of Seventeenth street.

4th. That the water at said point of intake is polluted and
29 contaminated by reason of the fact that one of the city's sewers at or near Twenty-sixth street empties into this stream

of the river a short distance above the intake; a polluted stream known as Cook's branch draining a large and thickly populated section of the city of Columbus likewise flows into the river a short distance above the sewer above mentioned; and the thickly settled manufacturing district known as Bibb City likewise drains and empties its sewerage into the river a short distance above the said Cook's branch, so that within a short distance of less than a mile above the intake one sewer and two polluted streams carrying sewerage empty into and contaminate the water.

5th. That by reason of the facts hereinabove recited, the water now being furnished to the city and its inhabitants is contaminated, impure and unfit for drinking or culinary purposes or domestic use, and because of the low state of the river and the water the supply is insufficient in quantity to furnish the necessary amount of water for domestic use and fire protection.

6th. That the dry season of the year is at hand and will in all probability continue for several months thereby aggravating the situation and bringing about an alarming condition threatening the health of the inhabitants and exposing their property to destruction by fire.

7th. Your petitioner represents that the emergency is immediate and extreme and that in order to avoid the evils which are reasonably feared as a result of the existing conditions it is necessary that prompt and energetic relief should be applied which at best will be temporary in its nature, and that in order to afford permanent relief and to guard against a repetition of the distressing conditions now obtaining your petitioner respectfully represents that it is necessary that the city be permitted to erect its system of waterworks, or some other adequate relief be granted.

Wherefore petitioner prays that the injunction *pendente lite* heretofore granted against it be dissolved and that the city be permitted to erect its own system of waterwork- and to take such steps as may be appropriate and adequate to cure the existing evils and provide a safe and sufficient water supply for the city and inhabitants and for fire protection.

T. T. MILLER,
J. H. MARTIN,
ELLIS, WIMBISH & ELLIS,
Solicitors and of Counsel for the City of Columbus.

Filing: Filed in Clerk's office 23d June, 1904.
O. C. FULLER, *Clerk*,
By J. D. STEWARD, *Deputy*.

31 *Answer of Mercantile Trust & Deposit Company.*

In Equity. In the Circuit Court of the United States for the Northern District of Georgia, Western Division.

Bill. No. 59.

MERCANTILE TRUST & DEPOSIT COMPANY OF BALTIMORE
v.
CITY OF COLUMBUS ET AL.

Now comes the Mercantile Trust & Deposit Company, and in answer to said petition, says:

First. It admits the statements contained in paragraph one of said petition.

Second. Respondent admits the statements contained in paragraph two of said petition.

Third. In answer to paragraph three of said petition, respondent says that the conditions have materially changed since the taking of testimony in this matter, but denies that said reservoirs have been temporarily abandoned, as a source of water supply, and that the entire water supply is now being taken from the Chattahoochee river, but says that the receiver, W. S. Greene, did cease to use said reservoirs except to furnish about one fourth of the supply from the reservoirs and did take the other three-fourths from the Chattahoochee river at Columbus.

Respondent is informed and believes that said receiver did this in order to economize his supply of water at the reservoirs in Columbus, on account of the great drought which is now existing.

Respondent is also informed and believes that a sufficient amount of water to supply the City of Columbus can be furnished at the present time from said reservoirs to supply the City of Co-
32 lumbus an ample quantity for all purposes for a period of over two weeks, and very probably a much longer time.

Respondent says that if river water should be used that the supply is ample for all purposes, and respondent is informed and believes it can be used, without damage to health, provided the same is boiled, until the flow in the river is changed by natural and providential causes.

Respondent further says that at the time he established the filter plant and commenced using water from the present point of intake that there was no sewerage emptying into the Chattahoochee river above 17th street, and that the use of said sewers for the purpose of sewerage has been permitted by the City of Columbus since the establishment of said filter plant.

Respondent says that the sewer which enters the river at 17th street is at a point below the intake of water by the water plant of the Columbus Water Works Company.

Respondent further says that all of the evidence was taken before the master covering the expense of getting water from a point on

the Chattahoochee river above the point of known contamination, and for the additional improvement of the system of the Columbus Water Works Company, all of which is of record in this case, and argument on said cause is set to be heard on July 11, 1904.

Respondent says that the various points of supply for the City of Columbus were investigated before the master, and the Mercantile Trust & Deposit Company and the bondholders in this suit can supply the City of Columbus from any point which may be found practicable on the hearing of said case before the master.

Fourth. In answer to paragraph fifth, respondent says that the allegation as to fire protection is wholly unfounded, and that
33 the other causes mentioned in said paragraph are explained by the various reasons now existing, the closing of the dam at Gainesville, and also at Bull Sluice, near Atlanta, and the existing drought.

Respondent believes in the natural course of events that the supply in the reservoirs will be increased by the filling of the reservoirs, and the normal conditions resumed.

In answer to paragraph sixth, respondent is unable to say as to the dry season continuing several months. Respondent does not believe it will so continue, nor does respondent admit that there is any alarming condition threatening the health of the inhabitants and exposing their property to destruction by fire.

Respondent respectfully represents that there is no cause for alarm and that there is no case of suffering in the City of Columbus, on account of a lack of drinking water. It says that in almost the entire territory, known as the annex, drinking water is supplied from wells, and that in the lower part of the city there are many wells and cisterns. In addition to this in the territory east and north of Columbus, there are a number of springs which can and do supply all necessary water for drinking purposes.

Respondent is perfectly willing to submit to any direction of this Honorable Court for the purpose of supplying the citizens, who may need drinking water, if any such necessity exists, and respondent prays that the alarming conditions described in petitioner's petition be not taken advantage of, in order to escape the injunction now pending, until after the final hearing of this cause.

Respondents will join petitioners in speeding said cause to a final hearing to its utmost ability.

Respectfully submitted,

HALL & WIMBERLY,
L. F. GARRARD,
Solicitors and of Counsel for Mercantile Trust & Deposit Co.

Filing: Filed in clerk's office June 25, 1904,

O. C. FULLER, *Clerk*.
By J. C. MOORE, *Deputy*.

34 *Order Dissolving Injunction Pendente Lite.*

In the Circuit Court of the United States for the Northern District of Georgia, Western Division.

In Equity. No. 59.

THE MERCANTILE TRUST & DEPOSIT CO.
v.
THE CITY OF COLUMBUS ET AL.

The above stated case coming on this day to be heard on the petition of the defendants, the City of Columbus, for a dissolution of the injunction *pendente lite* heretofore granted by the court, towit, on the 19th day of November, 1903, and each of the parties concerned having appeared and submitted evidence and argument, it is thereupon and upon consideration thereof,

Ordered and decreed by the court that the injunction *pendente lite* granted on the 19th day of November, 1903 be, and the same is hereby dissolved.

This without prejudice to the rights of the respective parties, or to the merits of the case as it may be determined on final hearing.

This the 25th day of June, 1904.

WM. T. NEWMAN,
U. S. Judge.

Filing: Filed in clerk's office 25 June, 1904,
O. C. FULLER, *Clerk.*

35 *Testimony on Motion to Dissolve Injunction.*

In the Circuit Court of the United States for the Northern District of Georgia.

In Equity. No. 59.

MERCANTILE TRUST & DEPOSIT CO.
v.
CITY OF COLUMBUS ET AL.

Hearing on June 25th, 1904, on Motion to Dissolve Injunction.

Before Hon. W. T. Newman, Judge Presiding.

W. S. GREENE, called and sworn in behalf of movants, testified as follows:

By Mr. WIMBISH:

Q. Will you please state whether you are the receiver of the Columbus Water Works Company?

A. I am.

Q. And hold your appointment under the order of this court?
A. Yes sir.
Q. In the cause, The Mercantile Trust & Deposit Company again the Columbus Water Works Company?
A. Yes sir.
Q. Major, please look at that paper, and state what it is?
A. I will, as soon as I can get my eyes. This is a special repo of the receiver W. S. Greene.
Q. And made to the court?
A. Made to the court, yes.
Q. Are you familiar with the facts set out in that report?
A. Yes sir.
Q. Are these facts true?
A. Yes sir.
Q. When was the 26th street sewer built, if you know?
A. I do not know.
Q. Has it been built since you have been in charge, as receiv there?
A. I don't know that. I did not know there was one on 26t street until it recently developed.
Q. You have seen none constructed, since you have been r ceiver?
A. No sir. I would not likely know it.
36 Q. Well, the branch known as Cook's branch. That serv as a branch of the stream when your filtration plant wa erected?
A. Yes sir.
Q. Now the branch on the Alabama side, known as the Bo branch, where I understand dead animals from Phenix City a placed?
A. Well, that is what I learned the other day.
Q. That was a fact?
A. Yes sir.
Q. Were they accustomed to place dead animals there before?
A. Oh I don't know. I never knew it until the other day when went to examine it. I thought they knew what they were talkin about.
Q. I want to know if there has been any such use of that branch so far as you know?
A. No sir.
Q. In the matter of Bibb City——?
A. There has been a change there.
Q. That branch was used as or for drainage at the time you filtration plant was erected?
A. Which branch?
Q. The Bibb City branch?
A. No sir. That sewerage was buried in the ground. I was u there with Mr. Comer, and he showed me the system, and I wen down what used to be the old boulevard, and drove around to se where they were burying the offal.
Q. That was just offal and refuse matter?
A. Yes sir.

Q. Still the surface drainage was all in the branch at that time?
A. Yes sir, the surface,—whenever it would rain it would go down that branch.
Q. What change has been made since?
A. I understand the superintendent has put down pipes and carried that drainage down the branch.
Q. Is Bibb City a part of the City of Columbus?
A. Not at all.
Q. You speak in that report of the race at the City Mills, and you say some thirty or forty employees, that is the refuse of their closets goes into that race?
A. Yes sir.
37 Q. Was that here at the time your intake was put in the river?
A. I suppose it was. I did not know that it was dumped into the race until all that was announced to me. It was unknown to me until last week, when I made an investigation. I will state another thing Mr. Wimbish, and that is during the month of May, and prior to that, I was down with rheumatism, and I left it entirely with the constructing engineer, Mr. McCormack; and the intake was put in when I was on the flat of my back. I found it all done when I got back, and I made no investigation because the thing was done. I found it done and made no investigation.
Q. Do you know of your own knowledge any change making a contamination of the river; and change of sewers or a branch entering into it, except at Bibb City?
A. I don't know of my own knowledge, only what I have heard. I did not go and examine, but I have heard about the permission to tap the Rose Hill sewer and 18th street sewer, prior to this one.
Q. Your information is that the 18th street sewer has subsequently been put in use?
A. Yes, sir.

(By the COURT:)

Q. Is that still farther up the river?
A. Yes sir, about 17th street.
Q. Is that the one entering into Cook's Branch?
A. Yes sir.
Q. The sewer goes into that branch?
A. The old brick wall, that's the sewer.

Cross-examination.

By Mr. GARRARD:

Q. Major, this sewer on 18th street. Were there any taps allowed by the City prior to the placing of the Water Works plant below 17th street?
A. I had understood not. But I don't know of my own knowledge.
Q. Don't you know that Alderman McPhail introduced an ordinance repealing the old ordinance which prevented people from making connection with these sewers?

38 A. I think I can state that. I think it occurred sometime in June, 1903.

Q. All of these permissions have been granted since the filter plant has been established?

A. Yes sir. The land was bought in March, and the work was about completed about the first of June. We began filtering the water in June, sometime.

Q. It was known that you had put your plant there?

A. It certainly was, yes.

Q. From whom did you buy the land?

A. It was bought from a man named Ensley. (?)

Q. Through whom was it bought?

A. It was bought through Mr. Chappell.—Chappell & Ryder.

Q. That is the present mayor?

A. Yes sir.

Q. I mean there was nothing secret about the purchase?

A. No nothing at all.

Q. And before that time there was no sewerage entering into that?

A. No city sewerage. There was——

Q. This has been done since that time?

A. Of course the sewerage of the branch has been going in always.

Q. Isn't it perfectly practicable for the city to turn that branch and that sewage south, and empty it below the intake above 17th street?

A. You mean the sewerage from Cook's branch?

Q. Couldn't the branch itself be turned?

A. Almost everything is practicable, if you have the money to do it. It would be a very costly thing. I think 17th street is thirty odd feet possibly above the bed of Cook's branch; and the fact that Cook's branch brings down a great deal of water, you would have to have a very large sewer to carry it down, and it would have to be carried down three blocks. It would be a very costly thing. It is practicable of course, but very expensive.

Q. Did you ever see a plan of the City's sewerage system. Explain about the sewer down on Third avenue to take Cook's branch down to the river in that direction?

39 A. That was the old sanitary sewerage. That matter was under consideration at the time they were talking about a sanitary system. I saw all these maps. That was to be one of the sewers of the city, but only to be used for flushing purposes, it was stated, my understanding was——

Q. Wouldn't that take the sewerage, if it was used for flushing purposes?

A. Yes, I suppose it would.

Mr. WIMBERLY: All that is in the record, and I think we could save time by using the record, if there is no objection.

Mr. WIMBISH: None whatever. We tender his report in evidence. (Admitted without objection.)

L. H. CHAPPELL, called and sworn in behalf of movants, testified as follows:

By Mr. WIMBISH:

Q. Mr. Chappell, state your official relation to the City of Columbus?

A. I am mayor sir.

Q. How long have you been mayor?

A. Since December 19th, 1907.

Q. Are you familiar with the water situation in Columbus?

A. I am.

Q. Mr. Chappell, please explain in your own way the condition as it exists at the reservoirs in Alabama, and the condition of the river at the point of intake, with reference to sewerage and contamination? State first, if you please, the condition of the reservoirs in Alabama?

A. The reservoir water is quite low. There are two reservoirs, the upper and the lower. The lower reservoir has perpendicular sides, and the water has a chance to settle in there and become comparatively clear. The water in the upper reservoir is taken from a stream called "Holland's creek." The sides slope in a very small slope, and when the water is low there is a very large area of this sloping bank exposed, and there seems to be a great deal of mud and other impurities that comes from the soil, that is first wet and then dry; and the water there is very muddy and unsightly.

Q. How about the lower reservoir?

A. Well, the last time I was there, which was on last Wednesday, the water was getting into the lower reservoir from the bottom of the upper one. The plan designed is to take the water from the top of the upper reservoir; but the water had subsided to that extent, that the gates from which it was to be taken from the top, were high and dry, and I suppose the company were forced to open the gate at the bottom of the dam for the water to get into the lower reservoir. The water taken or flowing into the lower reservoir was taken from the upper reservoir, and was identically the same water, the only difference being it had more or less chance to settle in the lower reservoir before being brought into the city.

Q. Was any water flowing into the reservoir?

A. A very small stream; a very slight stream; not more than six inches wide, and I suppose two inches deep. Just a mere little trickling stream. What would be Holland's creek in wet weather, there is two branches of it. There are two branches, both called Holland's creek I think. There were two of these little streams about the size of your hand.

Q. What is it you call the other one? Has it a different name?

A. No sir. I think not. I think they are both the same.

Q. Holland's creek, and Hannah's branch?

A. Well, I don't know that.

Q. What volume of water was there in the reservoir?

A. I don't know. I know it was far below the gates where they usually draw it off in the upper reservoir. It was down several feet

below the gate which was designed to draw the water into the lower one. I don't know how deep it is, and I don't know the acreage; and if I did it would take some little time to figure on the volume.

Q. Is there a drain there from the lower reservoir, for distribution into the city?

A. Yes sir.

Q. How many days' or weeks' supply would you say was in
41 the reservoir?

A. It would be a mere guess. I don't know.

Q. What is the conditions surrounding the intake from the river?

A. Well, they have two pumps running, one at 17th and one at 18th street. The one at 17th street runs out into the deep portion of the river, and takes the water from that point. There is nothing specially striking right immediately around the intake. The water, however, comes from the river above which receives the discharge from Cook's branch, and Cook's branch drains a very large area of very thickly settled city.

Q. Well, is there a sewer at 18th street?

A. Not emptying into the river, no.

Q. Does that empty into Cook's branch?

A. The sewer runs one block on 18th street, and then empties into Cook's branch. It comes down from Hamilton avenue, turns down 18th street, flows down one block, and then into Cook's branch.

Q. How long has that been constructed?

A. Many years.

Q. And been in use?

A. Been in constant use.

Q. Has there been any additional connections allowed to that sewer?

A. There was an ordinance passed in 1896 I think, prohibiting water closets to be connected with sewers which did not empty into the river, and as this sewer did not empty into the river that ordinance applies to that sewer. It only prohibited the connections of water closets. It did not prohibit the connection of bath tubs, kitchen waste, or anything but water closets.

Q. When was that ordinance repealed?

A. I think it was repealed in 1903, the first one. I am not sure.

Q. Speaking of Cook's branch. Explain the character of the sewerage that comes down that branch?

A. Well Cook's branch is a branch which runs parallel with the river, at some distance——

By the COURT: If it don't make any difference,—as a matter of fact I know it myself. But I would like to hear from Mr. Chappell about the water situation in Columbus. I don't want to interrupt you unless you prefer to have it in the record.

42 Mr. WIMBISH: I want to get it into the evidence that if that be a fact, that the City has done nothing since the erection of this plant to contaminate the water. That is my purpose.

WITNESS: Cook's branch runs south, approximately parallel with the river for quite a distance, and then turns into the river about

19th street. It runs through a very thickly settled settlement, and of course it receives the washings from that settlement.

Q. Do water-closets drain into it?

A. Oh yes, a great many of them use it.

Q. Have there been any changes made by or under the authority of the City which would affect the quality of the water, or add to its contamination?

A. Of Cook's branch?

Q. Of Cook's branch, since the erection of this intake?

A. With the exception of permitting water-closets to connect with sewers that empty into Cook's branch. There are only two that empties into Cook's branch, and the permission, or rather prohibition of water closets has been withdrawn. There may have been a larger or a smaller number connected since that time.

Q. Did the city have anything to do with this race by employees of these mills, for water closet purposes?

A. None whatever. At the City Mills the conditions are unchanged there for a number of years past.

(By the COURT:)

Q. The City could have that stopped, couldn't it? That's one thing?

A. You asked me about the two intakes. I have not referred to the City Mills intakes.

Q. Yes, I want that too?

A. The City Mills intake is right at the grating which holds back the trash and garbage, and the drift. It comes right down, and is right close to that open grating. Against that grating, especially at all times of dry weather, there is a collection of vegetable matter, dead wood and dead animals, if they happen to come along there, and they are there prevented from going to the wheels by
43 this grating; and there is at this time quite a collection or accumulation of that kind of material formed on top of it, and which did not fall against this grating, but which washes and drops down from that. If a shower comes it washes down immediately at the intake. Of course with reference to Cook's branch, and other sewers above that——

(By the COURT:)

Q. Isn't there some way by which that accumulation of drift wood and stuff could *not* be taken away from there every day?

A. I should imagine that something could be done; whether it would be to clean that off every day, or to run the intake a little higher up. It seems to me a very bad place for an intake. A few joints of pipe would carry it above that trash and garbage. It would certainly escape that trash and garbage.

Q. Has the City any authority over this branch that runs into Phenix City, referred to as the Bone branch?

A. None whatever.

Q. What authority has the city over the sewerage at Bibb City?

A. None whatever.

(By the COURT:)

Q. You don't think the water in the Bone branch would affect very much the water on this side?

A. I have seen that but once, and that was this week, and there was no water flowing. It was dry. Of course if a rain should come, it would wash in an accumulation, and——

Q. But would it get over to this side?

A. It would not, unless it was brought about by the current. It would naturally flow down the Alabama side; but it might be brought over by the current. I don't know what the effect would be, but it is on the Alabama side.

(By Mr. WIMBISH:)

Q. Mr. Chappell, suppose the water flowed over the dam, would this accumulation be liable to drift across the river?

A. I rather think it would. I think the dam is so constructed as to incline the water over to the Georgia side.

Q. How far is the point of this Cook's branch where it empties into the river from the City Mills, above that intake?

44 A. I would say 600 feet. The City Mills is at 18th street, and Cook's branch runs out at 19th street, a distance of about a block. It would be about 600 feet.

Q. What about 26th street?

A. Well now, there are two sewers which are referred to as 26th street sewers. One of these empties into the river at the extreme west end of 26th street. That has been there for a number of years; built perhaps in 1901 or 1902, I should say. There is another sewer referred to as 26th street sewer which empties into Cook's branch, that drains a large area east of Cook's branch. It is on the watershed of Cook's branch.

Q. Is it practicable to drain that part of the city above 18th street, either from Cook's branch or otherwise, by draining it into the river, above or below?

A. No sir.

Q. Would it be practicable to take that accumulation of sewage and take it up by 17th street and put it into the river?

A. I don't think it would. In times of freshets Cook's branch is an enormous body of water. I have seen it float away bridges, and one or two houses.

Q. What is the situation in the city with reference to water for drinking purposes? Anybody suffering there for water?

A. The people are put to very great inconvenience and expense. I don't know that they are suffering from thirst; but it will have an important effect, for I am quite sure a number of people are drinking water which was declared impure. Many other people are buying their water.

Q. For drinking purposes?

A. For drinking and cooking.

Q. What is the cost of water for drinking purposes?

A. A cent a gallon.

Q. How much does that amount to a month, for an average family?

A. Well about two dollars and a half a month. An average family will take from a dollar and a half to two dollars a month. I have been buying my water, and it costs me from a dollar and a half to two dollars a month.

Q. How is that water furnished? Is it sufficient?

A. No it is very inadequate. One or two wagons are going
45 around, and they dip it out of a barrel and carry it into the house.

Q. Do I understand the supply is adequate?

A. No sir. I have been told that the lady who is running that business, that she is not able to keep up with the orders; that she has to turn off many people because she is not able to haul it.

Cross-examination.

By Mr. GARRARD:

Q. Mr. Chappell, couldn't the City see to the hauling of that water on some systematic plan?

A. I don't think it would be possible for them to do it; to distribute water to the entire population.

Q. I mean just the drinking water?

A. I don't think it would be possible for it to do it. Of course it might be done, but it would require a very elaborate equipment. We have 55 miles of street, and 35,000 inhabitants, and if we attempted to supply every body, they would all want it.

Q. I mean couldn't you keep up with the orders?

A. If we were to offer it to them free?

Q. No, sell it to them for a cent a gallon?

A. I don't know whether I could or not. If we run the price up, we might take the orders at a cent a gallon, and fill a certain quantity; but if we offered it free, we couldn't do it.

Q. A cent a gallon is a very reasonable price?

A. Yes, pretty reasonable. I would not like to haul it for that.

Q. Is there anybody you know of in Columbus who is absolutely suffering for water?

A. Yes sir.

Q. Who?

A. If you want a case: There was a gentleman in my office, who is commercial agent for the Seaboard Air Line, and it just happened that he told me he was bothered about water, and that he was going to have his water brought up——

Q. I did not say "wanting it"; but absolutely suffering?

A. I don't know about that; but he is very seriously inconvenienced.

46 Q. Don't you think the word "suffering" is too strong? It is a serious inconvenience, but is it really suffering?

A. I don't know about that. I think suffering is a relative term; I think it is about right.

(By the COURT:)

Q. You said it would be about 600 feet. What would your judgment be about running the pipe up there to get above Cook's branch, and getting rid of this trouble?

A. My opinion is you could get rid of a very large proportion of the contamination, for that Cook branch is practically an open sewer.

Q. It would change very materially this analysis you have? Of course you are not a chemist?

A. I could not tell about that. That would be ascertained if all the intakes would go above Cook's branch. To my mind it would be very much better. (This last question was by Mr. Garrard.)

Major W. S. GREENE, recalled by movants, testified as follows:

By Mr. WIMBISH:

Q. I want to ask you about that same matter I asked Mr. Chappell about. What do you think about running one of your intakes up about Cook's branch?

A. I think the intake that comes from the 17th street pumping station, that it could be run up on the other side so as to take water above Cook's branch. I don't know that the one at the power house can be done that way.

Q. The one you have down below, that would be the one you would run?

A. Yes; and we would have to quit using the other pump entirely.

Q. Well, that is entirely practicable, or is it? if you extend your intake that you spoke of? If you would extend it, how would that operate?

A. I don't know if that would give us sufficient water; we might have to use both pumps.

Q. Have you not a pump you would use now for the one you say you could extend?

47 A. Yes, but that one is a power pump, and is the one you see in the Columbus Railway Power House, that takes its water from——

Q. You don't know whether it is sufficient to get the water up if you were to extend the pipe above Cook's branch?

A. If you were to extend that, I don't know how we could extend that pipe without cutting a hole through some one's land and taking the pipe through. That is the only thing I think of. The other pipe would run across the river to carry it.

Q. Could it be run alongside the bank of the river to a point above that, in any way, and then connect with the power house?

A. We could move that pipe in a special position and put it up on the bluff.

(By the COURT:)

Q. What I am asking this about is to see what might be done immediately?

(By Mr. GARRARD:)

Q. Could you move the pump so that the intake could be thrown
the upper side of the dam, and then turn it and go north above
ook's branch?

A. I have not examined it sufficiently to say.

(By Mr. WIMBISH:)

Q. Major, how many pumps have you there at the filtering sta-
on?

A. We have three. Two that pump out of the clear water basins,
nd which has no connection with the river. Then we have one
st below the filter plant on the edge of the river. That does
rnish river water. That is the one whose intake goes seven or
ght hundred feet up the river, and ends I suppose 150 feet south
the present pump of the Columbus Power House.

Q. How many pumps have you for distribution at the filter?

A. Two.

Q. What is their capacity?

A. A Thousand gallons each a minute.

Q. And you have only those two pumps?

A. Yes sir.

Q. Is that sufficient, Major, in case of an emergency, if one
ould break?

A. Oh yes.

Q. To keep the town supplied?

A. Yes sir.

8 A. E. BOARDMAN, called and sworn, testified as follows:

By Mr. GARRARD:

Q. You are familiar with the situation at the City Mills?

A. I am.

Q. With the steam pump and the water pump of the Columbus
Water Works Company?

A. Yes, sir. I have been acting as filtering engineer to the
eceiver, and am perfectly familiar with the whole situation.

Q. Please state to the court whether or not it is practicable to
arry out the idea suggested by His Honor; that is, taking the water
bove Cook's branch?

A. There is no engineering difficulty in taking the entire sup-
ly of water above Cook's branch. I don't know that I would ad-
ise trying to move the pumps already there, because at a very little
nore expense, a more economical plan could be adopted and car-
ied out, in which one pump would be located upon the river, tak-
ng the suction well above Cook's branch and pumping the river
vater directly into the settling basin, until such time as it is neces-
ary to use river water, and in much larger quantities than these
wo pumps now installed could do it, and at much less expense.

Q. What would you suggest?

A. I would suggest putting in a centrifugal pump to run by

electricity at a point above Cook's branch, running a pipe from that point and connecting with a 12 inch pipe that supplies the settling tank; that pump to be of a capacity sufficient to supply all the water that the filters would take; that for a temporary emergency.

Q. You mean until the improvements?

A. Until the contemplated improvements are carried out for a permanent plant.

Q. Above Bibb City?

A. Yes sir.

Q. How long would it take to get this improvement?

A. I think it could be done inside of a month.

Q. Do you undertake to say you could do it in a month?

A. Yes sir.

Q. Would that remove the difficulty?

49 A. That would improve the water very greatly.

Q. The other two pumps, their intake could be carried farther north so as to accomplish the same purpose, if thought best to do it?

A. It can be done, but it would be very expensive and rather difficult. The other is less expensive, and cheaper in the end.

Mr. GARRARD: We undertake to say to your honor, if your honor orders that done, that we will do it.

(By Mr. WIMBISH:)

Q. What would it cost to make the change in the improvements?

A. About five thousand dollars.

Q. That would still leave the water exposed to the contamination of Bibb City?

A. Yes sir.

Q. And 26th street, also?

A. Yes sir.

Q. Do you think the water would then be fit for domestic use?

A. I think it would for quite a while, until the population increased up there; but I don't think as a permanent arrangement I would recommend taking the water as low down as that.

Q. You installed the plant at Columbus?

A. Yes sir.

Q. And in your testimony in this case you were clearly of the opinion that the filtration would take out all the impurities?

A. Take out, I think I said 95%.

Q. 98% you said?

A. Yes sir.

Q. You thought the water would be absolutely fit for domestic use regardless of contamination?

A. Yes sir.

Q. Have you seen fit to change your opinion?

A. Yes, I have. The introduction of so much more sewerage, I believe your honor, at a time when the river was exceedingly low, it had increased the contamination to such an extent that even two per cent. is quite perceptible, and it would require aseptic treatment

to remove it entirely, which was not contemplated as the plans are designed and intended for a temporary thing. A permanent arrangement could be made to get water above all contamination.

(By the COURT:)

50 Q. I suppose there is no question about the fact that when the water is very low, it makes so much less water for the contamination to operate on?

A. Yes sir, and it is so much more intense that the filters cannot remove it entirely. It will remove a large percentage, but the percentage which remains is of such a concentrated solution as to be a matter of very grave doubt.

(By Mr. GARRARD:)

Q. Can we reasonably hope when we have rains, and turn loose this water above, that it would improve conditions there?

A. Very much, and I think inside of a week. We have already given orders for such improvements in the filtration plant, that the amount will be very perceptibly decreased, under present conditions even. But I am free to admit that it would be better to take the suction above Cook's branch.

Q. Do you think the conditions would be very much improved if the city would stop throwing the dump from the carts above the City Mills?

A. Any trash on the bank there would be objectionable, and the City could aid the Company very much in preventing by prohibiting the dumping out on the river bank.

I think it is due the receiver at the point in the investigation of the conditions prior to locating the intake where it was, should be more fully explained. The receiver was suffering from rheumatism, as he says. I made an investigation, and quite a thorough one, before we decided to take any water from that point. I found that at the Bibb Mills, the system of what is called "the bucket system" was in effect, so that no fecal matter went into the drainage nor into the river, but was put in tubs, and these tubs emptied and the contents buried in the reserve above, near the old boulevard. I witnesses that myself in operation. They were trenching and burying the offal there at the time, so that I did not consider that was an item of contamination at that time. The sewer at 18th street running into this branch which flows into the river just above the City Mills; the sewerage at that point was not at that time contaminated by water closets, as that was prior to the revocation of this

51 order, so that while there was a certain drainage area, with a few surface water closets upon it, they were not affected by rains washing down into this branch to any considerable extent. They already had one intake, or an intake for one pump, (what is called the Power pump) at the City Mills, which took the water from the wheel pit. This wheel pit was protected by a grating to protect the wheels from floating logs or trash from breaking them. At that time there was no dump of garbage, or paper or anything of that kind at the City Mills, nor could one imagine that such a thing

would be allowed by the City, as to dump garbage immediately at the City Mills, as the pump was situated right there. At the present time they are dropping this city garbage immediately opposite this wheel pit, and a slope that will go down into the river and wash up against this grate protection to that wheel. That is the state of affairs existing now. If that had not been put there, there would not be as much against the grate. Of course if dead animals come floating down, it would be perfectly feasible to have them taken out, but this stuff your honor saw there, and that I saw there caused by dumping immediately above the intake where the water flows down from the race, at the time the intake was located there, the conditions now prevailing did not prevail to a large extent, but have occurred since, and could be remedied. We should have the co-operation, and I think will have the cooperation of the City when it is pointed out to them, to remedy these evils. Now Mr. Wimbish, I am very sorry to know that I have fallen from grace in his estimation. I think it is in the record, and I think I made it clear this morning, that while two per cent. under ordinary circumstances of sewerage or microbes flowing through the filters would not be bad, but that it would be a menace to any water when the sewage becomes a larger proportion than two per cent.; it then becomes a quantity that should not be neglected. And that is the condition
52 that did exist when the sample was taken for analysis by the State Chemist. I think if a sample was taken today by the State Chemist, that the proportions would be much less than when he did get it, because there is more water going over the dam last night than yesterday morning. What caused it, I do not know, but presume from rains up the river, or the filling up of the dams and allowing the natural flow to come down, since your honor was there. Be that as it may, I am quite confident in saying that the enlargement of the flow of the river over what it was when that sample was taken, it would bring the percentage down so low as to make it negligible. I have given orders, in addition to the coagulum being placed in the filters, a proportion of lime, which will filter it much more readily and destroy all microbes. In regard to the Chemist's report, the indication is that there is sewage contamination. It would take a bacteriological examination to say that there was anything deleterious in it. The indication is that it is a suspicious water, not that it is unfit for domestic use, but that precautions should be taken.

(By the COURT:)

Q. You mean that it is unhealthy?

A. I mean that it is a suspicious water; suspicious from the evidence that there is some sewage contamination, and that it should not be used except by boiling, because there is food in that for microbes. Whether microbes exist in the water of a deleterious character is not shown, and it would take a bacteriological examination to prove the water is unhealthy. But it is *a* suspicious, and any one purveying water should not send out suspicious water without warning the public.

Cross-examination.

By Mr. WIMBISH:

Q. When you testified in March, I believe it was, did you know of the fact then that these water closets were connected with that sewer?

A. No sir, I did not. I did not know until yesterday that there had been any change regarding that sewer.

53 Q. When you testified that taking out 98% of the impure matter would in your judgment bring the quantity down where it would be not dangerous to health, did you know then that condition of things existed, the connection of the water closets, and the position of the intake pipe?

A. I did not know of any change there when I decided the water would be fit, after taking out the impurities.

Q. With the same facts before you when you gave your first opinion, would your opinion be the same as you gave then?

A. It would. I don't think the sewerage would pass sufficiently to be bacterially bad.

Q. You say you examined the location. You knew then that there was a sewer at 18th street?

A. I knew the branch was there, and I saw the sewer.

Q. Has there been a single water closet connected with that sewer?

A. Yes, I think there were sixteen.

Q. Have you any positive information about that?

A. Only what they tell me; that permissions have been issued.

Q. So you say there have been 16 closets connected since then?

A. Since June, 1903. My examination was made in March.

Q. You know that Cook's branch drained a large and populous surface?

A. Yes sir.

Q. You knew there was a large number of water closets——

A. Not on the branch, but on the shed.

Q. You knew of the sewer on 26th street?

A. Yes sir.

Q. How many closets have been added to that one since?

A. I don't know. I could not answer that.

Q. Do you know of any?

A. I don't know about that. I didn't inquire about that.

Q. You knew that the Bone branch was on the Alabama side?

A. No, I did not go on the other side of the river.

Q. You knew at the City Mills that it has thirty odd employees and that the discharge from their bodies was going into the race?

A. No sir, the Bibb Mills——

54 Q. I asked you if you knew the conditions existing at the City Mills, with reference to the discharge from the bodies of these employés going into the race, at the time you made the investigation?

A. No.

Q. Did you make any investigation?

A. I went and looked over the ground and saw no evidences of contamination.

Q. You located your intake so as to get the benefit of all that refuse?

A. There is an intake down below, which is sometimes used, but not often.

Q. Into which intake does that fecal matter flow?

A. It would only affect the lower intake.

Q. Where was it dropped?

A. I think it is dropped into the race way.

Q. Have you made a careful investigation of it yet?

A. No. I went over it yesterday, but the time was limited. I did not go into the mill.

Q. You did not discover that. In your investigation you knew of this grating. You say the city has been dumping trash etc. so as to be caught in that?

A. Somebody has.

Q. Where was that dumping?

A. Almost opposite that grating.

Q. On the bank?

A. Yes sir.

Q. How long has that been going on?

A. I don't know, but there is a good deal there.

Q. When did you first see*t* it?

A. Yesterday afternoon.

Q. Has there been rain since you first saw it?

A. Not that I know of.

Q. Do you know whether any of that has been carried down since then?

A. It would fall down by the slope of the bank.

Q. Without any rain?

A. Yes sir.

Q. Did you see any evidences of it at the grating?

A. I saw some paper against it.

Q. Was there evidence that satisfied you that it came from the dumping on the bank?

A. Yes, there was some evidence of it having come from the dump on the bank, and had flown over there.

55 Q. You say in Bibb City they buried the fecal matter. Now wouldn't that seep into the river?

A. I think not.

Q. You knew the surface drainage was carried off by the branch?

A. Yes sir.

Q. It is a right populous community, a village?

A. Yes, it is a right populous village.

Q. And you consider this point of intake a safe and proper point to do you, notwithstanding the existence of these sewers and branches?

A. For a temporary supply at this time, yes.

Mr. Boardman: May it please your honor, the hearing of the re-

ort before your master is set for July 11th, and on the hearing of hat, and the arguments, you will make your judgment. Now endin- the time between now and the 11th, your receiver can test his bility to remedy the situation. Now the City would probably not nove to any extent more than to expend a thousand or two to get his drinking water, which you have just as much right to expend o give to them, without doing injustice to either parties. Now, I nderstand, as a practical man, the vital importance that no cloud hould be placed on the bonds, or the certificates which may have o be issued by your order, to carry out any scheme of improvement hat, after the Master has made his report to you, you may dete- nine to——

By the COURT: What do you say can be done by July 11th?

A. I say at that time your receiver can prove his ability to remedy he situation of filtering the water, and pass it under the review of he State Chemist. He can show if it can be made possible, at the nd of the hearing——

Mr. WIMBACH: Are you a member of the bar?

A. No sir. I was asked——

Q. What interest have you in the matter?

A. None at all except justice. I am engineer for the receiver, and and am talking in the interest of the receiver.

6 Q. Do you know that there are a number of houses which line the bank of the river, that have their closets on the atershed, and that every rain washes it into the river?

A. No. I don't think every rain washes it into the river, because s a general thing it is protected by the overhanging of the closet. Iay it please your honor, on every watershed there are more or less rivies.

Mr. WIMBISH: If the court will permit me. I don't know how nuch of this the court will care to hear tonight?

WITNESS: As a matter of fact, please your honor, the water closet r privy as usually constructed, is sufficient protection from washing y rain, unless there is a stream formed by the rain that washed nder or through the place of deposit. I think an order for the rivies to be placed under the bucket system would be a good matter.

Q. Did you ever ask the City to prevent this dumping?

A. I never had any idea they were doing it.

Q. You were consulting engineer. How often did you go there?

A. Three or four times a year.

Q. Have you never made any investigation about the surroundings nce the first time?

A. Not with any view of the dumping by the City of the refuse. 'hat was not my province.

Q. Now all these closets were there, and the sewers too, when you ave your testimony in this case in March, were they not?

A. I suppose they were.

Q. And had been there for some months before that?

A. Before? I don't know that.

Q. Did you find the water perfectly pure down there?

A. The water was perfectly pure at that time by the Chemist's return.

Q. The fact is these sewers were running in, and closets were on there in March, at the time you gave your testimony that it was perfectly pure?

A. Yes; and it would be now, if the same conditions prevailed.

57 (By the COURT:)

Q. Had there been an analysis made between the time he made the analysis last fall, and now?

A. There was no river water being used while we were there in March, so if the analysis had been made then, it would not indicate the condition of the water.

(By Mr. WIMBISH:)

Q. Was that analysis McCandless made that you had the discussion over, one bottle being better than the other? Was that river water, or reservoir water?

(Major GREENE:)

A. I am sure it was a portion of river water. I know there was both. I don't think there was any river water in the bacteriological examination made in Baltimore.

Mr. GOETCHIUS: By request of the Court to examine the record: If your Honor please "I find the same of water received of the Columbus Water Company contains as follows." The one made in Baltimore dated 9th September, 1903, sworn to at that time, states that it was taken from the reservoir. That is the affidavit. Let me get that right. The analysis made September 7th, 1903 received from Wilson, Colston & Co., states it was taken from the reservoir.

(By Mr. WIMBISH:)

Q. You say the water shown by the last analysis is only suspicious; not bad?

A. I say that it indicates that it is a very suspicious water. (Note: This is analysis Mar. 22d/04. H. R. G., Martin).

Q. Have you seen the report of the State Chemist?

A. Yes sir.

Q. What do you think he means when he says it means very bad water. What do you think he means?

A. I think he means he thinks it a suspicious water, and should not be used except by boiling.

Q. You think it is very bad water?

A. I think a water which shows a trace of sewage should be used with care.

Q. What is that shown by?

A. By the amount of albuminoid ammonia, and by the amount of chlorine.

Q. How much albuminoid ammonia would make it bad?

A. Amount per litre?

58 Q. Yes?

A. I should say one part would make it suspicious.

Q. And did you say chlorine?

A. Yes sir.

Q. How much of that would make it bad?

A. I should be suspicious if it was more than one part, unless I knew the source; because chlorine is salt. If it is from sewerage contamination, it is suspicious. If it came from an artesian well, it would not be suspicious.

Q. You would call two parts very bad water?

A. Yes, I would say it is quite suspicious, and should be taken only by boiling. But when you think of one part in a million it is little under two per cent.; it is decimal 116, or indicating ten times as much as ought to in water to be absolutely pure. To be potable, there if ten times as much albuminoid ammonia, and there is over twice as much chlorine as should appear in the water.

Q. What effect does boiling have on impure water?

A. Boiling has two effects; destroys the bacteria, and tends to precipitate the solids in solution.

Q. It destroys the bacteria in it?

A. Yes sir.

Q. Are there not some germs in water just as deleterious dead, as alive?

A. I hardly think so, because it would pass through the alimentary canal without injury.

Q. You don't know then there are some dead germs as dangerous as live ones?

A. I don't think there are.

(By Mr. WIMBERLY:)

Q. I believe they asked you about the drainage on the Alabama side. Does the drainage on the Alabama side affect the intake on the Georgia side, or the water at that point?

A. To some extent. When the water is low, and there is not much flowing over the dam. With a full river, it would not affect it much, unless it was a considerable distance above it.

Q. Do you know where Phenix City is?

A. Yes sir.

Q. Do you know whether that is far enough up the river to affect it to some extent?

A. Where I think that branch is, it would only affect the intake in comparatively low water.

Q. You spoke of the city dumpage. Would it be necessary

59 for the city to carry it any farther, or much farther in order to dump it below the City Mills dam?

A. No, I don't think they would have quite so far to go. But it depends on what part of the city it is taken from.

—. How far from the city proper was that dump taken from?

A. I don't think it would extend over fifty feet above.

Q. If they were to dump it one hundred feet below, would that be below the main intake?

A. Yes. It would not be below the other intake pipe from which water is taken occasionally.

Q. To dump it below the intake pipe you sometimes use, how far would they have to carry it?

A. About two hundred yards.

Q. By carrying it 200 yards, they could get below both intake pipes?

A. I am satisfied that can all be remedied.

Q. You think, so far as that is concerned, there would be no trouble?

A. I think not.

Q. Mr. Boardman, they asked you about certain surface privies scattered along on the sides, and water closets connected with sewers. How do those two sources compare in bacteria, or in making water impure? I mean the actual sewer drainage, as compared with a water-closet placed on the ground?

A. The entire amount of the fecal deposit from a closet connected with a sewer goes into the sewer and into the stream without much change. In surface privies, even when there is some seepage, as there necessarily is through the soil, the bacteria, in the soil is acted upon almost immediately, and before it has gone very far it changes its character. Thus manure put in the ground, rots very rapidly, and passes down. The effect would be very slight, unless there was a stream running down through the ground.

Q. So that a water-closet connection with a sewer, is very much worse than the other?

A. Oh very much. There is no relief from that at all.

Q. Is it possible in that part of the country to get any source of supply sufficiently abundant for a town the size of Columbus
60 without getting it from a stream along which there are privies?

A. I don't think there is. There are no cities I know of in Georgia, or Alabama, or South Carolina, or North Carolina above the artesian belt. But I think all that is in the record.

Q. There is one thing in this analysis I want to ask you about. In the first column a milligram is one millionth part of a litre?

A. Yes.

Q. So that two million parts of chlorine, you mean in every million parts of water, there are two of chlorine, and when you say .116 parts of albuminoid ammonia, you mean 116-1000 of one part, not a million parts?

A. Yes.

Q. A little over one part to ten million?

A. There is one-tenth of one part in a million.

L. H. CHAPPELL, recalled, testified as follows:

By Mr. WIMBISH:

Q. I will ask you if this dump he speaks of is a city dump?

A. I don't think the city has ever dumpted at that place. It has a dump at 26th street where the refuse matter is dumped there on an iron grating and burned. If there is any other dump south of that, I don't know what it is.

Q. Has your attention ever been called to any private dump, or of any matter being dumped there at all?

A. No sir.

Q. Mr. Chappell, in the event this injunction was dissolved, in what way could the city improve the situation?

A. I will state that I am *ex-officio* a member of the Water Works Commission, composed of five citizens of Columbus, and from the work being done, we realize there is a great deal of preliminary work, such as engineering, and measuring the different sources of supply, the securing of profiles, estimates, options, etc., and material. It took us a good while to get as far as we had proceeded before the injunction was granted, and I think it would take us a good
61 while, and careful study of the situation with our engineer, to determine the very best source of supply. I believe in having all that work done, we could save a number of months in the final construction of a plant, should we be allowed to construct it.

Q. That should be done without any actual work of construction?

A. There is a good deal to be done without any actual work is undertaken.

(Mr. WIMBERLY:)

Q. Mr. Chappell, the city controls everything pertaining to health within its limits?

A. I think so.

Q. It could control proper action with reference to this dump?

A. I could order it looked after. The city could deal with it.

Q. The city has not decided on any source of supply, has it?

A. It has not.

Q. Mr. George Pearce of the city mills, is an officer of the city himself?

A. He is a member of the Water Works Commission.

Q. And is manager of the City Mills?

A. Yes sir.

Identified July 11/04.

HENRY R. GOETCHIUS,
Master in Chancery.

Filed in clerk's office 11 July, 1904.

O. C. FULLER, *Clerk.*
By N. A. BROWN, *Deputy.*

62 *Special Report of the Receiver.*

In the Fifth Circuit Court of the United States for the Northern District of Georgia, Western Division.

In Equity. No. 57.

THE MERCANTILE TRUST & DEPOSIT COMPANY OF BALTIMORE, Trustee,
v.
THE COLUMBUS WATER WORKS COMPANY.

Bill for Foreclosure and Receiver.

COLUMBUS, GA., *June 24th*, 1904.

To His Honor Judge William T. Newman, one of the Judges of said Court:

In compliance with the request of your honor of date June 23rd, 1904 instructing me to furnish you with a full report on the present waterworks situation in Columbus I respectfully submit the following:

First. I herewith append as Exhibit "A" to this report copy of the letter of your honor to me of June 17th, 1904 with reference to present conditions.

Second. Copy of my letter to your honor of June 17th, 1904 herewith attached marked Exhibit "B." On the 18th instant I sent a specimen of the water to the State Chemist as referred to in my letter, Exhibit "B." At the date of the writing of that letter I had not made a personal inspection of the conditions immediately north of the filter plant.

Third. Pending the investigation of the State Chemist in company with certain members of the water board I visited the reservoirs. I found that the conditions of the Alabama reservoirs were not good. There was no water running over the beds of the two creeks which supply the reservoirs, upper and lower. Whatever water was going into the reservoirs was percolating through
63 the sand beneath the surface. The water in both reservoirs was from six to seven feet below the normal, but appeared comparatively clear and free from any appearance of stagnation. This was especially true of the lower reservoir. There was some slight stagnation along the margins or feather edges of the upper reservoir where exposed to the sun, and the water from this reservoir was slightly muddy in entering the lower reservoir.

Fourth. The conditions on the east or Columbus side were examined by your receiver and the same party of members of the Water Board, together with his Honor, the Mayor of the City of Columbus, on the afternoon of June 21st instant. I found the conditions extending along the river for one half mile above the point of intake for the water from the river extremely bad. Owing to the

extended drought which has prevailed in this section for many weeks past, and the failure of the supply streams for the reservoirs, I found it necessary on the sixth of June instant, or about that date, to begin to take water from the Chattahoochee river through the intake pipes from the Seventeenth street station. One of these intake pipes is located immediately below the City Mills just above the foot of Seventeenth street and was placed there pending my receivership to meet emergencies. The other intake pipe is located a few hundred feet below the one just mentioned, and was in place when I took charge as receiver. It is located to the west of the City Mills and just at the water gates where the water flows into the tail race of said mill. Immediately in the neighborhood and just above these intak-pipes are a number of closets attached to said mills where some thirty operatives are daily at work. A few hundred yards above this point Cook's branch enters into the river on the east side. This branch is an open sewer draining a territory occupied by probably several thousand population, and there enters into what is known as the Eighteenth street drain sewer and the Twenty-sixth street drain sewer. Above the mouth of Cook's branch and a few
64 hundred yards to the north in close proximity to the east bank of the river is the city garbage dump and crematory for that portion of the city. On the west side of the river at a point nearly opposite this is a gulch called the dry bone branch, which I am informed is the dump ground for dead animals on the Alabama side of the river from Phenix City. Just north of the last named point a few hundred yards on the east side of the river is the sewerage drainage from the Columbus Manufacturing Company and the territory immediately contiguous thereto, which is a mill operating I am informed some three hundred operatives. A few hundred yards north of this point is a mill village called Bibb City and the site of the Columbus Power Company Mill and the sewerage from this locality is also discharged into the river. The intake of the Seventeenth street pumping station being just below the City Mills, and the intake of the power pump being directly under the same, sewerage from the mill affects the intake of the 17th street pumping station, but not that of the power pump, both however get the sewerage from the Cook branch and from the factories above, as well as from the Alabama side. When the suction pipe of the 17th street station was laid in 1903, I learned that there was no city sewer on Rose Hill being used for closets, and that there were service closets close to the Cook branch. Since then however the 18th street sewer has been put in commission and eighteen permits given for connection, and three permits for connection with Twenty-sixth street sewer, also put in commission. Owing to extreme drought and the low stage of the river the unsanitary conditions have become very pronounced, and for fear that filtration had not removed the bad element I had an analysis made by the State Chemist, John M. McCandless. As the water in reservoirs was too low to furnish a full supply of water, and as I only had the river as an auxiliary
65 supply—I was forced to get it from the river, and finding it to be bad, I have notified the water takers of Columbus that the water was unfit for drinking or cooking purposes unless

boiled, as boiling will render it fit for use. There are 1583 connections with the water works mains for all purposes,—residences, offices, stores and manufactories and stables, and only those residences included in the 1583 are affected,—the others getting water from springs, wells and cisterns. None but the patrons of the Water Works Company are in any way affected by the bad state of the water. And the fire pressure not being affected at all, as there is abundant pressure at all times, and plenty of water up to this time and will be as long as water runs in the river. I do not know the exact number of water takers who use the water for drinking and domestic purposes, but if the total 1583 represented residences and allowing five for a family there would be 7915 citizens only affected, and whilst that is too many, it is small in comparison with amount of citizens who are entirely independent of the Water Works Company, the population being estimated I think at 30,000—including the highlands,—north and east of old city and within corporate limits.

Fifth. I received the report of the State Chemist on the analysis of the water on the morning of the 23rd instant, and immediately prepared and had published in the Columbus Evening Ledger of the afternoon of the 23rd instant a notice to water takers, and also had the same published in the Columbus Enquirer Sun of the morning of the 24th instant, and said notice is now running as an advertisement.

I herewith attach as Exhibit "C" to this report copy of said notice and copy of analysis of the State Chemist.

This June 24th, 1904.

Respectfully submitted,

W. S. GREENE, *Receiver.*

66

EXHIBIT "A."

ATLANTA, GA., *June 17th*, 1904.

Major W. S. Greene, Receiver Columbus Water Works Company, Columbus, Ga.

DEAR SIR: I have a letter from the Board of Water Commissioners of Columbus, in which they make complaint about the present source of supply of the plant of the Columbus Water Works. They say that the source from which it was designed originally the supply should be received, that is I presume of course from the creek beyond the river, it has been found advisable to shut off entirely, and that the water is now being obtained from the Chattahoochee river at a point within the city limits where it is subject to contamination from sewers and the drainage of a large territory thickly settled in the city limits, and that a very large number of the people are again buying their drinking water, and having it hauled from suburban wells and springs.

I call your attention to this matter, and ask that you furnish me at once with a report on this subject. It is my wish at an early date to go down to Columbus, look into this matter personally, and to

hear any suggestions that can be made on this subject, with a view of giving the matter some proper direction.

I had thought from what I had seen and heard when in Columbus recently, that the water works were in fairly good shape, and would continue so until the litigation concerning the same could be disposed of in the regular, orderly way. If, however, the situation is such as represented by the Board of Water Commissioners, it seems to me that the court should endeavor to give the receiver some authority to remedy the difficulty and relieve the situation, if there is any practicable way of doing so.

Please let me have a report on the situation at the earlies- date possible.

Very truly yours, WM. T. NEWMAN.

67 EXHIBIT "B."

COLUMBUS, GA., *June 17th.*

Judge W. T. Newman, Atlanta, Ga.

DEAR SIR: I beg to acknowledge the receipt of your letter of this date and to reply as follows:

Several days ago, when the drought was almost at its maximum, I thought that the same conditions might obtain at the Alabama reservoir as was the case in 1902 and I closed the main leading from there and got all the water for filtering from the river. At that time the gates from Bull Sluice dam had not been closed. When they were closed the river was reduced to a small creek, affording very little water. I then began to mix it with the reservoir water and am doing so now. The water being colorless and odorless, and I cannot see anything wrong with it except the idea of river water, into which contamination can flow. The water at the reservoirs is clear and whilst the upper one is five feet below the normal, the lower one from which we take water is only about two feet normal. The water being over 20 feet deep at dam and perfectly clear.

The idea of drinking river water is repulsive to almost every citizen of Columbus and although Atlanta and Macon use river water, Columbus cannot get used to it.

The present situation is caused by the excessive drought and nothing except rain can relieve it. I have only two sources of supply, the Alabama reservoir and the river, and both will entirely fail without rain soon. On tomorrow I will send a gallon of the water I am furnishing to the city to the State Chemist and have it analyzed. It seems to be perfectly pure. It is colorless and odorless, but any analysis may prove it not fit for drinking purposes. I will request the State Chemist to furnish you with a copy of
68 analysis as soon as it is made. There has been no change in the condition of the water since your visit here, as far as looks and taste go. I will be glad to see you here and go over the situation with you.

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Very respt., W. S. GREENE, *Receiver.*

EXHIBIT "C."

Notice to Water Takers.

Owing to the unprecedented drought I have been drawing on the Chattahoochee river since the sixth of June instant, for four-fifths of water supplied through the filter plant. It has been found by analysis that although the present filtered water is colorless and odorless, it is not fit for drinking or cooking purposes, and water takers are requested to discontinue the use of the water for those purposes until notified to the contrary. In consideration of this fact, I am authorized by the court having control of the water property, to allow a rebate for the month of June on the bills due July 1st, 1904, by residences, offices and stores using water for drinking purposes. As long as present conditions continue, a similar rebate will be allowed for each quarter.

The present conditions in no way affects the fire pressure of the water system or the use of the water for any purposes except cooking and drinking as above stated.

I am directed by his Honor, Judge Newman, to notify the public that he has under consideration a plan for speedy consummation to relieve the above stated conditions, and furnish pure water during the pending litigation. When a sufficiency of rain restores the reservoirs to a normal condition, the use of river water will be entirely dispensed with, of which fact I will give prompt notice.

The analysis of the State Chemist and his report on water I am now furnishing is herewith appended. I caution water takers not to fail to boil the water before using.

Columbus, Ga., this June 24th, 1904.

W. S. GREENE, *Receiver.*

69 *Certificate of Analysis.*

ATLANTA, GA., *June 22nd*, 1904.

I find the sample of water received from E. M. Wheat, Columbus, Ga., by express, and marked "five-eighth gallon of water taken from main basin of Columbus Water Works Company's plant Saturday, June 18th, 1904," to contain as below: (Results in first column are expressed in milligrams per litre, or, as is sometimes called parts per million. In the second column are given the equivalent in grains per United States gallon.

	Milligrams per litre.	Grains per U. S. gallon.
Free Ammonia	0.064	0.00373
Albuminoid ammonia	0.116	0.00676
Nitrogen as Nitrates	0.150	0.0087
Nitrogen as Nitrites	Faint trace.	
Chlorine	2.000	0.1166
Total solids	45.000	2.6243

The water shows no trace of alum, but the analytical figures indicate a very bad water. The albuminoid ammonia being particularly high.

Respectfully submitted,

JOHN M. McCANDLESS,
State Chemist.

July 11, 1904.—Identified and admitted in evidence in hearing No. 59.

HENRY R. GOETCHIUS,
Master in Chancery.

Filed in clerk's office June 25, 1904.

O. C. FULLER, *Clerk.*

70 *Affidavit of Receiver Showing Facts as to Analyses.*

In Equity. No. 59.

MERCANTILE TRUST & DEPOSIT CO., OF BALTIMORE, MD.,
v.
CITY OF COLUMBUS ET AL.

GEORGIA, *Muscogee County:*

In person before the undersigned appeared W. S. Greene, Receiver of the Columbus Water Works Co., who on oath says that the paper hereto attached marked Exhibit A, and signed by Jno. M. McCandless, State Chemist, of date June 25th, 1904, is an analysis of a sample of water of the Chattahoochee river at Columbus, Ga., which deponent procured to be made under verbal order of his Honor Judge Newman, to be presented on June 25th, 1904, in Atlanta, at the time the hearing was to be had on the motion to dissolve the injunction *pendente lite* that said analysis was not completed in time to present to his Honor on the above named date, and was afterwards presented July 11th, 1904, by Counsel for the City of Columbus, to the Master in Chancery Henry R. Goetchius, pending argument of the said cause under reference to him. Deponent says that the sample of water referred to in said analysis was taken from the Chattahoochee river above a point in the river known as Clapps factory, and at a point just below the mouth of Roaring creek. This sample was taken when the river was very low, deponent was not personally present when the sample was taken, but learned afterwards that it was taken at a point below and very near to the mouth of said creek, and it was thought that the particular point where it was taken was not a suitable point. Deponent herewith submits said analysis and his sworn statement in accordance with the direction of the Master asking that deponent give statement of facts as to the procurement of said sample. Deponent further says that in accordance with the direction of the Master, he had other samples procured and herewith submits analysis of the same and statement under oath of the facts as to the procure-

ment of said sample, towit: On July 12th, 1904, deponent
71 had the State Chemis- to come in person to Columbus, and take sample and make analysis as shown by Exhibit D, hereto attached. The sample at my request was taken by the State Chemist in person, and at a point in the river just above Roaring creek. I thought it best to also have the State Chemist to make a Bacteriological analysis as well as chemical of the river water, and accordingly on Aug. 3rd, 1904, the Assistant State Chemist, Dr. R. G. Williams, took a sample of the river water, just above the dam at Bibb Mills, and another sample of water from the tank of said mill, which had been filtered and was clear, the process of filtering being known as the Jewell filter. These two samples were taken with scientific precaution in sterilized bottles packed in ice and shipped to the State Chemist, who made analysis and report to me as shown by Exhibit C and D, hereto attached.

I also had the State Chemist to make a chemical analysis of the sample taken from the Bibb Mill tank, bacteriological analysis of which is shown by Exhibit D, aforesaid, and the chemical analysis in his report of statement is shown by Exhibit E, hereto attached.

Deponent says that it was impossible to have the aforesaid analysis completed and submitted by Aug. 1st, 1904, as directed by the Master, and the time limit being extended to Aug. 10th, at special request of the deponent, he herewith submits same.

W. S. GREENE,
Receiver of the Columbus Water Works Co.

Sworn to and subscribed before me this August 10th, 1904.
[SEAL N. P.]
A. W. COZART,
Notary Public, Muscogee County, Ga.

72

EXHIBIT A.

Certificate of Analysis.

ATLANTA, *June* 25, 1904.

I find the sample of river water received from Columbus Water Works Co., marked "Sample Chattahoochee River Water," to contain as below: (Results in first column are expressed in milligrams per litre or, as is sometimes called, parts per million; in the second column are given the equivalents of the milligrams per litre in grains per U. S. gallon.)

	Milligrams per litre.	Grains per U. S. gallon.
Free ammonia	0.074	0.00431
Albuminoid ammonia	0.086	0.00501
Nitrogen as Nitrate	0.15	0.00874
" " Nitrite	Trace.	Trace.
Total solids	42.00	2.449
Chlorine	1.5	0.0874

Sample filtered in laboratory by use of alum.
I cannot recommend the use of this water.
Respectfully submitted,

JNO. M. McCANDLESS,
State Chemist.

73 EXHIBIT B.

Certificate of Analysis.

ATLANTA, *July 16th*, 1904.

I find the sample of Chattahoochee river water received from Major W. S. Greene, Receiver, marked "Taken at my direction above Roaring Creek" to contain as below: (Results in first column are expressed in milligrams per litre or, as is sometimes called, parts per million; in the second column are given the equivalents of the milligrams per litre in grains per U. S. Gallon.)

	Milligrams per litre.	Grains per U. S. gallon.
Free ammonia	0.05	0.0029
Albuminoid ammonia	0.03	0.0017
Nitrogen as Nitrate	0.40	0.0233
Nitrogen as Nitrite	0.00	0.0000
Chlorine	1.80	0.1050
Total solids	50.00	2.9159

This water was filtered by me through paper, after treatment with alum. The analytical figures indicate a very pure water.
Respectfully submitted,

JNO. M. McCANDLESS,
State Chemist.

[Seal J. M. McCandless, State Chemist of Ga.]

74 EXHIBIT "C."

ATLANTA, *August 8th*, 1904.

Bacteriological Analysis of Sample of Chattahoochee River Water Taken from the River at Bibb Mills, Just Above the Dam, Aug. 3rd, 1904.

Gelatin plate cultures after 48 hours at 20° C.:

Number of colonies per C. C.	2300

Agar plate cultures after 24 hours at 37° C.:

Number of colonies per C. C.	2000
Out of seven fermentation tubes, those showing gas	7
Of these, typical of Bacil-us Coli	2

Litmus, Lactose agar plates, were all partially liquefied, and reddened with numerous colonies.

Nitrate test, Negative.

Indol Reaction, Positive.

Bad Water.

Respectfully submitted,

JNO. M. McCANDLESS,
State Chemist.

75 EXHIBIT "D."

ATLANTA, *August 8th*, 1904.

Bacteriological Analysis of Sample of Chattahoochee Water Taken from the Clear Water Tank at the Filter Plant of the Bibb Mills, Aug. 3rd, 1904.

Gelatin plate cultures after 48 hours at 20° C.:

Number of colonies per C. C.	6

Agar plate cultures after 24 hours at 37° C.:

Number of colonies per C. C.	5
Out of 7 fermentation tubes, those showing gas	0
Typical of Bacillus Coli	0

Litmus Lactose Agar plates at 37° for 24 hours:

Number of colonies	5
Red colonies	0

Nitrate test, Negative.

Indol reaction, negative.

Very pure water.

Respectfully submitted,

JNO. M. CANDLESS,
State Chemist.

76 EXHIBIT "E."

Certificate of Analysis.

I find the sample of Chattahoochee river water received from Major W. S. Greene, Receiver, marked "taken from clear water tank at Bibb Mills, Aug. 3rd," to contain as below: (Results in first column are expressed in milligrams per litre or, as is sometimes called, parts per million; in the second column are given the equivalents of the milligrams per litre in grains per U. S. Gallon.)

	Milligrams per litre.	Grains per U. S. gallon.
Free Ammonia	0.02	0.00116
Albuminoid ammonia	0.05	0.00291
Nitrogen as Nitrites	0.00	0.0000
Nitrogen as Nitrates	0.15	0.0087
Chlorine	0.40	0.0233
Total Solid matter	50.00	2.9159

This water was beautifully filtered, clear and brilliant, and the analytical figures indicate water of the highest purity.

Respectfully submitted,

JNO. M. McCANDLESS,
State Chemist.

Aug. 10/04.—This affidavit and exhibits attached were permitted filed and to become a part of the record under my ruling of July 11, 1904. Exhibit A. was presented at that time by counsel for the City and objected to by counsel for complainant trustee, and the master ruled that complainant could have additional analyses made if desired, all to be filed by Aug. 1, 1904, with the master,—time afterwards extended to Aug. 10, 1904. Exhibits herein of B, C, D and E, are submitted and admitted as evidence on part of trustee.

HENRY R. GOETCHIUS,
Master in Chancery.

Filed in clerk's office 19 Nov. 1904.

O. C. FULLER, *Clerk.*
By N. A. BROWN, *Deputy.*

77 *Renewal of and Amendment to Charter of Columbus Water Works Co.*

In Muscogee Superior Court, State of Georgia, Muscogee County.

In re THE COLUMBUS WATER WORKS COMPANY.

To the Superior Court of said County:

The petition of the Columbus Water Works Company, a corporation under the laws of said State, respectfully shows that said corporation was duly incorporated under the name and style of the "Columbus Water Works Company," by an order of the Superior Court of said County, signed on the 24th day of November, 1881, by the terms of which said order the said Columbus Water Works Company was duly chartered, and under which said charter said corporation organized and has continued its corporate business up to this time.

2nd. Petitioner shows that the order of incorporation fixed the capital stock of said company at $75,000, with the privilege of increasing the same to the sum of $150,000 in shares of fifty dollars each. Petitioner further shows that heretofore said capital stock has been duly and legally and in accordance with said charter increased to the maximum sum of one hundred and fifty thousand dollars.

3rd. Said charter was granted for a period of twenty years with the privilege to said corporation of a renewal of its said charter at the expiration of said time.

4th. Petitioner desires that said charter may be so amended that the maximum amount of its capital stock may be fixed at the sum of $210,800.00.

5th. Petitioner further shows that it desires a renewal and extension of its charter as granted by the original order on incorporation by said Muscogee Superior Court, together with the amendments thereto in the 4th paragraph of this petition prayed for, the said amendments to take effect immediately, and become a part of the charter of this company, and the renewal and ex-
78 tension of said original charter, and said amendments thereof shall be granted at once by this Honorable Court in advance of the expiration of said charter, for a period of twenty years, from and after the expiration thereof.

6th. Petitioner files with this petition a certified abstract from the minutes of this corporation showing that this application for renewal and amendment of its charter has been authorized by the proper corporate action.

Wherefore, petitioner files this, its petition and prays that after the filing and publication of this petition, as required by law, the court will pass an order, granting the amendments of said charter and the extension and renewal thereof, for the period of twenty years from the date of the expiration, with the usual privilege of renewal thereof.

And your petitioner will ever pray, etc.

COLUMBUS WATER WORKS COMPANY,
By LOUIS F. GARRARD,
Its Attorney.

Office of the Columbus Water Works Company.

COLUMBIA, GA., *May 6th*, 1899.

At the adjourned annual meeting of the stockholders of the Columbus Water Works Company, duly held at the office of the company, in the City of Columbus on the 6th day of May, 1899, the following resolution was unanimously authorized by proper corporate action, to wit:

Resolved, that Louis F. Garrard as attorney for this company is authorized and directed to apply to the Superior Court of Muscogee County, in the name and behalf of this company, for an amendment and renewal of the charter of this company, extending the corporate existence of this company for an additional period of twenty years, and further by increasing the capital stock of this company from one hundred and fifty thousand dollars to two hundred and ten thousand and eight hundred dollars.

79 I hereby certify that the above is a true extract from the minutes of the Columbus Water Works Company.

[SEAL.] LOUIS F. GARRARD, JR., *Secretary.*

Filed in office this 10th day of May, 1899.

JNO. C. COOK, *Clk.*

Recorded August 24th, 1899.

JNO. C. COOK, *Clk.*

GEORGIA, *Muscogee County:*

Personally appeared before the undersigned, R. W. Page, who on oath says that he is the proprietor of the Columbus Ledger, a newspaper published in the City of Columbus, County of Muscogee and State of Georgia, and upon oath further says, that the application for amendment to charter of the Columbus Water Works Company was duly published according to law in the Columbus Ledger, on the following days, to wit: May 11th, 18th, 25th, June 1st, and 8th, a copy of which said advertisement is hereto annexed and marked "Exhibit A."

R. W. PAGE.

Sworn to and subscribed before me this the 13th day of June, 1899.

[SEAL.] FRANK U. GARRARD,
Notary Public, Muscogee County, Georgia.

GEORGIA, *Muscogee County:*

In the Superior Court of said County, May Term, 1899.

In re COLUMBUS WATER WORKS COMPANY.

Order for Amendment and Renewal of Charter.

The Columbus Water Works Company, a corporation duly incorporated under the laws of the State of Georgia, having filed in the office of the Clerk of the Superior Court of said County, its petition, signed with its corporate name, showing that said Company is an existing corporation, duly incorporated and organized as a
80 corporation under the name and style of the Columbus Water Works Company, by an order of the Superior Court of the County of Muscogee, and said State of Georgia, signed on the 24th day of November, 1881, by the terms of which said order, the said Columbus Water Works Company was duly chartered and under which said charter said corporation organized and has continued its corporate business up to this time, and that the charter of said corporation expires by limitation of law at the expiration of twenty years, to wit, on the 24th day of November, 1901, and praying for an amendment and renewal of its said charter, and said corporation having filed with its petition a certified abstract from its minutes by which it is shown to the court that the application for amendment and renewal of its charter has been authorized by proper corporate action; and it further being made to appear to the court that publication of said petition has been made in terms of the law, and that said corporation has complied with all the requirements of law, in accordance with the statutes in such cases made and provided; and that the amendment and renewal of said charter as prayed for in said application are proper and legitimately within

the purview, authority and intention of the laws of the State of Georgia, and the authority of this court.

Whereupon, it is ordered, considered and adjudged by the court that the prayer and application of said petition be and the same is hereby granted as prayed for, and that the charter of said corporation as set out in the order of the Superior Court of Muscogee County, heretofore granted on the 24th day of November, 1881, is immediately so amended that the maximum amount of its capital stock shall be fixed at the sum of two hundred and ten thousand and eight hundred dollars, and the said Columbus Water Works Company, is further incorporated and made a body politic, and its charter as amended is renewed and extended for a period of twenty years from the date of the expiration of its present charter, towit: twenty years from the 24th day of November, 1901, and all the rights, privileges and franchises heretofore granted to the said Columbus Water
81 Works Company by said order of incorporation are by this order amended, renewed and extended with the usual privilege of renewal thereof at the expiration of said time.

In open court this the 15th day of June, 1899.

W. B. BUTT,
Judge Superior Court Chattahoochee Circuit.

L. F. GARRARD,
Attorney Columbus Water Works Company.

Filed in office June 16th, 1899.

W. S. LLOYD, *Dp. Clk.*

Recorded Aug. 24th, 1899.

JNO. C. COOK, *Clk.*

GEORGIA,
Muscogee County:

CLERK'S OFFICE SUPERIOR COURT.

I, Van Marcus, Clerk of the Superior Court of Muscogee County, said court being a court of record in and for said county, do hereby certify that the annexed and foregoing five (5) typewritten pages contain a full, true and complete copy of the proceedings had for renewal and amending the Charter of the Columbus Water Works Company, as of file and record in my said office.

Given under my hand with the seal of said court affixed, this August 3rd, 1904.

[SEAL s/c.] VAN MARCUS,
Clerk, Superior Court, Muscogee County, Georgia.

Identified and filed Aug. 4th, 1904 as of file with original charter.

HENRY R. GOETCHIUS,
Master in Chancery.

Filed in clerk's office 19 Nov. 1904.

O. C. FULLER, *Clerk,*
By N. A. BROWN, *Deputy.*

82 In Equity. In the Fifth Circuit Court of the United States for the Western Division of the Northern District of Georgia.

MERCANTILE TRUST & DEPOSIT COMPANY OF BALTIMORE, Trustee,

vs.

THE CITY OF COLUMBUS, COLUMBUS WATER WORKS COMPANY, L. H. CHAPPELL, as Mayor, and E. P. DISMUKES, J. I. DARBY, W. C. LAWRENCE, J. D. MCPHAIL, N. L. DUDLEY, L. T. JONES, R. WEILAND, J. T. MONCRIEFF, J. L. NEWMAN, W. J. HARTMAN, L. A. CAMP, F. M. SOMMERKAMP, E. J. WYNN, J. H. MCKNIGHT, MAX BANNER, and T. E. MITCHELL, as Aldermen.

Bill.

THE CITY OF COLUMBUS

vs.

MERCANTILE TRUST & DEPOSIT COMPANY OF BALTIMORE, Trustee; COLUMBUS WATER WORKS COMPANY, and WILLIAM S. GREENE, Receiver.

Cross Bill.

Report of the Master on Reference.

Filed in Office November 19, 1904.

O. C. FULLER, *Clerk*,
By N. A. BROWN, *Deputy*.

Joseph Packard, Hall & Wimberly, Louis F. Garrard, for the Trust Company.

T. T. Miller, J. H. Martin, and Ellis, Wimbish & Ellis, for the City of Columbus.

For the Water Works Company and the Receiver, no Appearances.

Henry R. Goetchius, Master in Chancery.

83 In Equity. In the Fifth Circuit Court of the United States for the Western Division of the Northern District of Georgia.

MERCANTILE TRUST & DEPOSIT COMPANY OF BALTIMORE, Trustee,
vs.
THE CITY OF COLUMBUS, COLUMBUS WATER WORKS COMPANY, L. H. CHAPPELL, as Mayor, and E. P. DISMUKES, J. I. DARBY, W. C. LAWRENCE, J. D. MCPHAIL, N. L. DUDLEY, L. T. JONES, R. WEILAND, J. T. MONCRIEFF, J. L. NEWMAN, W. J. HARTMANN, L. A. CAMP, F. M. SOMMERKAMP, E. J. WYNN, J. H. MCKNIGHT, MAX BANNER, and T. E. MITCHELL, as Aldermen.

Bill.

THE CITY OF COLUMBUS
vs.
MERCANTILE TRUST & DEPOSIT COMPANY OF BALTIMORE, Trustee; COLUMBUS WATER WORKS COMPANY, and WILLIAM S. GREENE, Receiver.

Cross Bill.

Report of the Master Under Reference.

Appearances.

For the Trust Company, Joseph Packard, Hall & Wimberly, Louis F. Garrard.

For the City of Columbus, T. T. Miller, J. H. Martin, and Ellis, Wimbish & Ellis.

For the Water Works Company and the Receiver, no appearances.

84 To the Honorable the Judges of said Court:

Under decretal orders of late November 19th and December 8th, 1903, respectively, the above stated causes were referred to the Master for full investigation and report upon all the questions of law and fact involved.

Pursuant to these orders, the taking of testimony began, after due notice to the parties, at the City of Columbus, Georgia, February 4th, 1904, and was concluded on March 10th, thereafter, adjournment from time to time being had by consent. Eighteen days were consumed in the taking of testimony, a very large volume of evidence, both oral and documentary, being submitted. The stenographic report of this testimony is contained in four bound volumes of file. Volume 1 covers 540 pages of typewritten and printed matter, and contains documentary evidence. The remaining three volumes contain a report of the oral testimony, the same numbering 1295 pages. In addition to this there are 50 pages of supplemental evidence admitted on file before argument. The entire record of

testimony aggregates 1885 pages. Counsel of record for the respective parties were present at the hearing and participated. Argument was had on July 11th to 13th, 1904, inclusive, and counsel subsequently submitted exhaustive briefs.

After careful consideration of this voluminous record and of the arguments and briefs of counsel, the Master has arrived at his findings and conclusions which are herewith submitted to the court as his report.

85 *Statement.*

The Bill was filed July 30th, 1903, by the Mercantile Trust & Deposit Company of Baltimore in the State of Maryland, hereinafter designated "Trustee." The defendants are the City of Columbus, a municipal corporation in the State of Georgia, and L. H. Chappell, the Mayor thereof, and sixteen other named persons in their representative capacity as aldermen of said City, and the Columbus Water Works Company, a corporation created under the laws of the State of Georgia, and located at Columbus, Ga. The defendant municipal corporation and its Mayor and Aldermen will hereinafter be designated as the "City," and the defendant Water Works Company will hereinafter be designated as the "Water Company."

The complainant in the Cross Bill, which was filed October 5th, 1903, is the City of Columbus, and the defendants named are the Trustee and the Water Company, and W. S. Greene, Receiver of the Water Company, who will hereinafter be designated the "Receiver."

The averments in the Original Bill are in substance as follows: On January 1st, 1891, the Water Company constituted complainant Trustee for the holder or holders of five hundred of its first mortgage, six per cent. twenty year gold bonds of the denomination of One Thousand Dollars each, and to secure payment of the same and interest thereon, executed to the Trustee a conveyance and assignment of all its property in hand, or afterwards to be acquired, consisting of its entire water works plant and its equipments and all the rights, easements, privileges and franchises, contracts and every other asset of the Company, especially designating among the assets so assigned and conveyed a contract made between the City and the Water Company. The bonds were issued for the purpose of providing funds to construct, and complete a system of water works in order to comply with a contract between the City of Columbus and the Water Company. The copy deed of trust is attached to the Bill as Exhibit "A," and is in evidence. The property conveyed under the deed consisted of lands in the State of Alabama and near Columbus, Ga., on which were located the reservoirs of the Water Company and the watersheds from which the supply of water was derived; also all
86 other realty and all personalty, including reservoirs, machinery, equipments of every kind in the City of Columbus and vicinity, and all charter rights, franchises and privileges under Georgia laws and ordinances of the City of Columbus; also all contracts made or to be thereafter made, during the continuance of the lien of the Trust Deed, between the Water Company and the City

of Columbus. After January 1st, 1895, the six per cent. rate of interest on the bonds was reduced to five per cent.; under the deed of Trust four hundred of the bonds have been delivered, of which eight are in the hands of the Receiver, and three hundred and ninety-two are now outstanding and held by purchasers in open market for value. The contract with the City was made October 7th, 1881, between the City and one Thomas R. White and his associates, who were to be incorporated, and was to run for thirty years; the Water Company was incorporated, and on April 5th, 1882, the City was notified that the Water Company had been organized and that White had transferred his contract; thereupon the City by formal resolution ratified the transfer. The copy contract is attached to the Bill as Exhibit "B," and is in evidence.

The Water Company constructed and completed a system of water works in accordance with the stipulations and requirements of the contract as transferred, extensions of time having been granted by the City, and the notice of completion was finally given on November 6th, 1882, through the President of the Water Company to the City and formal acceptance was had from the City. Appended to the Bill is Exhibit "C," (also in evidence) showing correspondence between the City and Water Company when the works were completed.

The number of fire hydrants originally provided for in the contract had been to the time of the filing of the bill, increased in accordance with the contract until the annual rental now amounted to $10,260.94, and $2,500 on rentals are now due and unpaid. By reason of the anxiety of the people of Columbus and the City that water works should be built an agreement was incorporated to receive due coupons of the water bonds in payment of taxes, and an-
87 nual appropriations should be made to pay the water rentals, and this agreement constituted an element of credit in the sale of the bonds and as such enabled the Water Company to sell its bonds at a better rate, and the same had passed into the hands of innocent holders for full market value, the holders taking the same on reliance on the faithful performance by the City of its obligation. In 1886, the corporate limits of the City were extended northward and eastward into a hilly territory, the highest point being ninety feet above the level of Broad Street and the gravity system of the old works were impracticable for this new territory, and in compliance with the demands of the City the Water Company had purchased land and established a stand pipe and had adopted a pumping plan and had distributed mains and had connected same with the old system, and under these improvements the pressure was improved and increased and the work of extensions had been done in a manner satisfactory to the City; notwithstanding the provisions in the contract for a fixed permanent annual income in proportion to main extensions, the Water Company had from time to time waived this stipulation and extended its mains until now the line of piping, including supply pipes, covered a distance of 27 miles, 23 of which were within the City limits, and there had been placed 157 hydrants; the contract was made with the full knowledge and free assent of the citizens of Columbus and without a popular vote being taken because

the sentiment was unanimous for adopting the contract, and the Mayor and Council were fully authorized to make the contract and the same was valid, legal and binding upon the City; the Water Company has used all of its income over the sum required to meet interest on its bonds in improvements on the system and for only once during the continuance of its contract, and then only for a few hours had it failed to provide water to the City; this contingency arose because of an unprecedented flood in the Chattahoochee River sweeping away the bridge on which its supply pipes were constructed and later breaking its submerged main; the Water Company without delay and at large expense re-established its connections by means of pipes constructed over another one of the river bridges.

88 It is further alleged that the City, in considering the execution of the contract, afforded the people ample opportunity to object to the same; there was much publicity as to the terms of the contract before adoption and different plans and systems were investigated, and when the contract was finally entered into no citizen or tax payer objected thereto; in pursuance of the contract the Water Company was incorporated under the laws of Georgia, the application for charter being published in the daily newspaper of Columbus, and the purpose of the Company being generally known to the inhabitants of the City; the Water Company proceeded to and did carry out its contract and from the date of acceptance of the works by the City has continued to maintain and operate its works, and at large expense to extend the same and has fulfilled all of its obligations, and the inhabitants of the City, by their silence and acquiescence, have secured to themselves the benefit of a water supply for domestic use as well as fire protection; the City knew at the time it entered into the contract that the money to build the system was to be raised in whole or in large part by the issue and sale of bonds and the rentals would be the source from which the bondholders were to be paid interest on their bonds and a fund provided for ultimate payment of the same, and for a long time the City would be practically the only customer of the Water Company, and in order to make the bonds more desirable the City agreed to accept due coupons for taxes as provided in the contract and the bonds were issued and sold *bona fide* to the public without objection on the part of the City or any citizen thereof.

The bill charges that the City, under the terms of the contract granting exclusive privilege to the Water Company to maintain and operate water works and to pay rent for hydrants and to purchase at stated intervals as provided, if it so desired, is estopped during the contract term from building or operating any water works system of its own, for its own use or the use of others, and that the period of the contract has not expired; that the City on September 14th, 1902, adopted an ordinance ordering an election to be held December 4th, 1902, to ascertain the will of the people on the question of issuing Two Hundred and Fifty Thousand Dollars of bonds, the

89 proceeds to be used by the City in building and operating its own water works system, and furnishing water in competition with the Water Company both for private consumers and its own

use; the election was held and the result declared in favor of the issuance of bonds; and the City was proceeding to advertise and sell the same. Attached to the Bill as Exhibit "D" is a copy of the ordinance above referred to, and as Exhibit "E" is copy of an extract from the proceedings of the Council authorizing the advertisement and sale of the City bonds, both of which are in evidence.

The Bill further charges that the city, by adoption of the said ordinance, and the attempted sale of the bonds, has repudiated its contract with the Water Company and violated the rights of the Trustee as representing the holders of the Water Company bonds; that the City has not given the Water Company any notice of its desire or intention to purchase the works of the Water Company as provided in the contract, and that all improvements which have been made from time to time on the present system have been made in accordance with the terms of the contract, and the demands of the City and under its direction; that the City is now seeking to establish and operate an independent water works system to compete with and destroy the present Water Works Company, and to render its property valueless and to deprive the Company of its property without due process of law and in disregard of the contract right of the Water Company; that this action on the part of the City is for the purpose of destroying the revenues of the Water Company and thereby force a sale to the City at the latter's own price.

It alleges that the Water Company is willing to sell to the City at a fair and reasonable price, but the City is unwilling to purchase in this way, and disregards the provisions of the contract as to option of purchase; that because of the constant agitation of the question of municipal ownership by the City, and its withholding of water rents and its adoption of the ordinance aforesaid and the bond election and the procurement of the passage of an Act by the General Assembly of Georgia on December 3rd, 1902, authorizing
90 construction of water works by the City, and for other reasons the Water Company had to default on its bond interest due January 1st, 1903, and on December 22nd, 1902 a bill had been filed by the Trustee in this Court for foreclosure; a Receiver had been appointed and was now operating the Water Works; the Receiver had at once had surveys and estimates made for perfecting the works and furnishing a sufficient supply of water for all purposes, and that with permission of the Court had issued Fifty Thousand Dollars of certificates and right had been reserved to issue One Hundred Thousand Dollars additional, which amount is sufficient to supply all possible needs of the City; that $2500 in water rents is due and unlawfully held by the City; the Water Company has no other revenue than such as is derived from the City and private consumers and the latter is largely exhausted in operating expenses, and the City rentals so withheld are needed to pay interest on the water bonds; the mains and machinery of the Water Company will become valueless except to be taken up and sold elsewhere, and if sold would not pay one fourth of the amount of out standing bonds; the City is not large enough to support two competitive water works systems, and the operation of a plant by the City would leave the Water Com-

pany out of business; because the water bonds are held by numerous private parties it has become necessary for the Trustee to file this bill; that all of the alleged wrongs are contrary to equity and good conscience and are irreparable and can only be relieved in equity. Jurisdiction of this Court is invoked in behalf of the Trustee acting for the bondholders and for such other persons as may be entitled to the aid of the Court. The prayer is for injunction, permanent and temporary; that the contract be declared valid and specifically enforced; also that the Water Company be made a party defendant to the Bill and the right of equity and subrogation be decreed against the Company and that specific performance may be had on its part, and for general relief; discovery is waived.

91 This Bill was presented to his Honor Judge Wm. T. Newman, on July 29th, 1903, and order *nisi* was granted, and hearing thereon set for September 28th, 1903.

On September 11th, 1903, the City filed its general demurrer, which was in substance as follows:

(1). That the Trustee had no such interest in the subject matter of the suit as to entitle it to bring the same, because there was no privy of contract between it and the City, or any allegation of facts on which an independent suit would lie: (2). If the Trustee had an interest, it has no title, for it is not alleged that it was requested by a majority of bondholders to institute the suit, and it does not appear from the deed of trust that such right or duty existed in absence of such request; (3 and 4) because the Trustee has no such interest as entitles it to call upon the City and is not entitled to the relief prayed for; (5) there is a want of proper parties in that the Water Company and the Receiver are indispensable parties; (6) misjoinder of parties in that the Water Company is not a proper party defendant as its interest is wholly that of complainant, and it does not appear that the Water Company had been requested and refused to join; the Mayor and Aldermen are not proper parties, the transactions set up being entirely with the City in its corporate capacity; (7) there is no equity in the Bill because there is no contractual or other obligation of the City building it not to erect its own water system; nor is it alleged that the City has revoked or attempted to revoke the franchise granted the Water Company; the City as a municipal corporation could not legally grant an exclusive franchise for the use of its streets and any attempt so to do violates the Constitution and Laws of Georgia and is void; for non-payment for use of water by the City the adequate remedy is at law; the Water Company being insolvent and under administration by the court, it is unable to comply with its contract obligations; there is no federal question in the Bill, it not being alleged that the City in its legislative capacity has revoked the franchise or impaired the obligations of the contract; there is adequate remedy at law to enforce collection of water rentals or other failure of compliance with the contract.

92 For special cause of demurrer the defendant showed:

1st. That the allegations in paragraphs 10, 11, 12 and 15

of the Bill as to acquiescence by the citizens were irrelevant and argumentative.

It does not appear that any order was entered making the Water Company a party as prayed for and no answer of the Water Company to the original Bill is of file.

The City answered the rule and on October 5th, 1903, filed its formal answer and also its cross-bill.

The answer in substance is as follows:

It admits the correctness of the statement as to parties except denial of the interest of the Mayor and Aldermen as individuals, and says the corporate name of the defendant municipality is "The City of Columbus." Issue of bonds and execution of trust deed is admitted. Proof is demanded as to the number and delivery of outstanding bonds. It is denied that bonds described in the Bill were issued by the Water Company to construct and complete the water system, but it is claimed that no bonds were issued for that purpose, and not till 1888 were bonds issued and then to the amount of $150,000 and the issue of 1891 was for the purpose of retiring the issue of 1888 and for payment of dividends to the stockholders of the Water Company and for other purposes, and that only a small part of the proceeds of this last issue went to extending and repairing the works, and the cost of the same, including all other expenditures thereon, was very much less than $392,000. The correctness of the communication of the Water Company to the City, of October 21st, 1882, tendering the works as complete, is admitted and the City acted thereon November 6th, thereafter, and acceptance of the works was had on the assurance of the Water Company that the filter referred to was an improvement on the one called for in the contract, and the further assurance that the works had been constructed in accordance with the terms of the contract, but it is denied that the system was completed in accordance with the contract in that the reservoir had a capacity of only 40 million gallons instead of 125 million as called for, which fact did not become known to
93 the City till 1893, when on account of a scarcity of water the City had made its own measurements and surveys of the works; that the street mains were not of sufficient size to afford water as called for in the contract, and at the time of the acceptance of the system the City had no way of knowing of this fact except from assurances of the Water Company; no filter as called for had been provided, and the one provided was useless and soon abandoned by the Water Company; the Water Company had failed to construct the reservoir free from stumps, roots and alluvial deposits, nor was unwholesome matter removed and feather edges avoided, but on the contrary the reservoir was so constructed that the water became impure and unwholesome in dry weather. It was admitted that the contract was a plan adopted by the City for procuring a water system and that the amount of annual rentals from the City at the time of the filing of the Bill was correctly stated. The provision of the contract as to accepting due coupons as taxes was admitted, but it is denied that this provision was agreed upon because of anxiety of the

people of Columbus to secure water works and did not constitute an element of credit for the sale of the bonds; that in whatever way this provision may be construed the effect would be that the credit of the City was a pledge only to the extent of the annual rentals due and no further. It is denied that the bonds passed to innocent holders for full market value, and that the holders obtained the bonds relying to any greater degree upon this special provision than on any other provision of the contract generally. The respondent claims that this provision, in so far as it sought to bind future actions of the City was null because nothing in the City charter authorized such action and no vote of the qualified voters was had thereon. It is further claimed that the holders of the bonds took with notice of this want of authority, and that if the contract was valid yet it was executory and only binding when the Water Company performed all of its obligations, and further that no rentals are due till the service is performed, and such performance is a question of fact depending on
94 the ability and good faith of the Water Company. Extensions north and east in 1886 and the erection of a standpipe and the laying of mains are admitted, but it is denied that this work was satisfactory to the City, but on the contrary that it was ten years before they were made after requested by the City, and when finally completed in 1900 failed to furnish a sufficient water supply to the new territory both on account of insufficient reservoir and supply mains, and that the service in the extended territory was inefficient. Extensions of mains to the distance of 27 miles and hydrants to the number of 157 is admitted, but denial is made that no income was derived in many portions of the City because of poverty of the people, and it is denied that the Water Company waived stipulations as to income and extended mains as desired. It is denied that the contract was made with the knowledge and assent of the people. It is admitted that the authority to make was not submitted to qualified voters, but it is denied that it was not necessary to do so, and denied that the City had authority to make the contract and bind the City; its validity and legality is denied. It is denied that all the income above demands for interest charges has been used in improvements. It is admitted that the bridge maintaining the main supply pipes was swept away, and that the Water Company put in pumping devices as alleged and built the main over another bridge. The breaking of the submerged main as alleged is denied. It is denied that the people of the City were given an opportunity of objecting to the contract and that the contract was accepted by every citizen as the authorized act of the City. Incorporation of the Water Company is admitted and construction of the system, but denial is made that the work is in accordance with the contract, or that after test it was found satisfactory, or that the Water Company has fully complied with the contract and furnished free and unrestricted water as alleged. Use of the water by the City since 1882 to prevent fire is admitted, but denial is made that the service was satisfactory. It is admitted that the people did not protest against the building of the system or extension thereof, and it is alleged that if the contract

had been fully complied with no differences would have arisen and that the people have been forbearing in order, if possible, to
95 avoid the differences. It is denied that the City had knowledge that the works would have to be built by a bond issue and that the City rentals would be a source from which would be paid bond interest. It is alleged that the system was not originally erected through a bond issue, nor was such issue necessary or made for that purpose. It is denied that the bonds as issued were sold to an unsuspecting public, or that the City invited purchasers by reason of the provision as to due coupons, or that the sale was on the faith of this provision of the contract, and it is denied that the proceeds of $392,000 of bonds were used in construction of the system. It is alleged by respondent on information and belief, that the system was originally built by money subscribed by the stockholders; that in 1888 the Water Company issued $150,000 in bonds to reimburse the stockholders, and in 1890 Epping, Foley and others bought the stock of the Company, and in 1891 issued $325,000 of bonds, and with the proceeds retired the issue of $150,000, and so much as was needed was used to reimburse the stockholders for the amount paid in purchase of the stock, and that the present bondholders knew or could have known that their bonds were not issued to construct or extend the system, and that it was not worth the amount of the bonds; that at the time of the issue of the present bonds and sometime prior thereto the water service was inefficient and unsatisfactory, of which repeated notice had been given the Company; that as early as 1885 the City formally declared the water insufficient and unwholesome, and demanded of the Company an improved system, and that in 1887 a committee from the Council and the Water Company superintendent tested and found the pressure insufficient; that an adverse report was made by the committee and rentals withheld; that the Company promised but failed to remedy the complaints, and the least diligence on the part of bondholders would have disclosed the inefficiency of the system, and that the water was unwholesome, the City dissatisfied and liable at that time to annul the contract. It is denied that the City is estopped by the alleged acquiescence of the citizens in the execution of the contract, the Company having elected in the first instance to deal with the City by express contract.
96 It is admitted that exclusive privilege was given the Water Company by the City to maintain and operate the system, and the City reserved the right to purchase at intervals of 15 years, but it is alleged that the right to grant exclusive privilege is forbidden by the Constitution and laws of Georgia, and such act on the part of the City was *ultra vires*, and that the contract of purchase conditionally or otherwise was likewise beyond the power of the City and invalid. It is denied that the City has not the right to build its own works during the period of the contract, same being illegal, but if legal it has been rendered invalid by repeated violations on the part of the Water Company. It is alleged that the City has not revoked or attempted to revoke the exclusive franchise or attempted to violate the contract, but that so long as the Water Company to any degree ap-

proximately performed its obligations the City was faithful to its obligations and remained so till conditions become intolerable, and it has become manifest that the Water Company cannot afford an adequate supply of water; that the City will continue to pay for so long as it uses the water of the Company, and it has declared repeatedly that the contract is executory and has been terminated by repeated violations. Passage of the ordinance of September 14th, 1902, and the election of December 4th, 1902, is admitted, but it is denied that the purpose was to provide for construction of water works as a competitor to the Water Company, but that the step was necessary because the public health demanded it, and the Water Company had failed to supply the City and its inhabitants with pure and abundant water as contracted for; that the ordinance revokes no right of franchise, or in anywise impairs the obligation of the contract. It is alleged that said election was carried by a vote of 1647 in favor and 7 against the issue of bonds, showing the practically unanimous desire of the citizens to escape from present conditions as to water supply. It is admitted that bonds under this election were issued and validated as provided by law and have been negotiated and sold, and the City proposes to devote the proceeds to the construction of water works. It is denied that said action on the
*97 part of the City is a repudiation of the contract. It is claimed by the respondent that the City has both a legal and equitable right to provide water for the citizens, and therefore can refuse to be further bound by an executory contract, when it has been shown that the Water Company has failed and is unable to comply therewith; that the Water Company being insolvent and in the hands of a receiver is unable to perform its contract if otherwise able. It is claimed that the right of the City, to the step admitted as having been taken, depended on conditions existing at that time, and is not to be affected by subsequent occurrences. It is denied that the City is under obligation to purchase the water system; denied that the works were supervised in the construction by a committee of Council and citizens, and that the requirements of the City were complied with, or that the right and franchises granted under the contract were to continue till the purchase of the system by the City. It is admitted that the City has made no offer of purchase, it being manifest, as respondent charges, that the system is inadequate. It is denied that improvements have been made as required in the contract and as the growth of the City demanded, and it is averred that the supply is inadequate unless resort is had to the Chattahoochee River. It is averred that the original supply main of 12 inches has never been increased, and that the street mains in many places are four inch mains with dead-ends, making it impossible to render efficient service, and that to provide a proper system of water works for the City it will be necessary to abandon the present source of supply and remove the present mains and pipes, and reconstruct in effect an entire system. It is denied that the City by its conduct purposes to render the present system valueless, or that the City by its act, and the General Assembly by its Act, purposes to impair the obligation of

the contract or deprive the Water Company of its property without the due process of law or disregard of contract rights, or that the City desires to compel the Water Company to sell its plant to the City at such price as the City may name. Foreclosure against the Water Company, as alleged and appointment of W. S. Greene
98 as Receiver, and the issuance of $50,000 receiver's certificates is admitted. It is denied that such an amount is sufficient to supply the needs of the City for water. It is neither admitted nor denied that the alleged constant agitation of the water question by the City led to the foreclosure proceedings. The alleged indebtedness of $2,500 as water rentals is denied on the ground that the Water Company has failed to give service as contracted for, but because of failure to supply had been compelled to resort to river water, and this was so foul and unwholesome the people had to buy water, resorting to springs and cisterns and wells and outside sources of supply.

It is denied that the Trustee has the right or that it is its duty to institute this suit without appropriate request from the bondholders if any right existed at all. The answer concludes with a general denial that the acts of the City are in violation of contract obligations or in any way illegal.

The cross-bill alleged in substance the execution of the contract and its transfer to the Water Company as incorporated. It then sets out alleged specific breaches on the part of the Company, to-wit: failure to comply as to filter, construction of reservoir, size and extent of mains, fire protection, quantity and quality of water and construction of the system to admit of extension. It charges that the City accepted the works on assurances of the Water Company to supply deficiencies complained of at the outset, and apparent shortly after the works were put in operation. Detailed alleged facts are then set out to illustrate these several alleged breaches. It is alleged the population of the City at the date of the contract was about 12,000 and is now about 20,000, but the Company has not increased the capacity of its supply mains nor provided for the increased distribution system now extending to 23 miles; that the reservoirs failed in many seasons of dry weather, and especially in 1895, 1898 and 1902, in the last named year there being an entire failure of water neces-itating a resort to river water. It is charged that under condition-
99 of 1902 the City in the exercise of its police power and for the protection of the health and property of the citizens was compelled to adopt the ordinance providing for bonds with which to construct water works.

The Bill, waiving discovery, prays that the court will decree the contract annulled and that the cross-defendants be perpetually enjoined from setting up any right or interest thereunder, and that the Receiver be made a party defendant, and that he and those represented by him be bound by the decree and that subpœna issue.

In the answer to this Cross-Bill filed December 7th, 1903, the Trustee denies the right of the city to affirmative relief, and further denies generally the averments of the Bill as to alleged breaches of the contract on the part of the Water Company. Answering

specifically it avers that the supply main is sufficient and that any reduction in pressure ever occurring was due to a temporary arrangement in having to build a supply main over the railroad bridge at Columbus because of the Providential destruction of the regular bridge over which the mains were laid and the breaking of the submerged main by an unusual flood; that all main extensions in the City have been under the direction of the City; that the territory annexed to the City in 1886 was never provided with sewers with which to properly drain the water used by the inhabitants thereof, and that the Company is willing and ready to supply water when there is proper sewerage; that the City has never been willing to comply with the terms of the contract as to extensions; that the City has never called upon the Company to change its source of supply or test the system as provided in the contract, but as far back as 1894 has threatened repudiation of the contract and placed obstacles in the way of the Company's making alterations or improvements on the system; that its demands for improvements were not according to contract and were unreasonable, and if complied with the City claimed that it would be bound thereby only for a term of one year. It is admitted that river water was used in 1902, but this was temporary and the intake was at a point free from sewage contamination, and that conditions in 1902 were unusual and due to unprecedented droughts. The answer avers that prior to 1902 all differences which occurred from time to time between the City and the Water Company had been corrected and settled, and that the Trustee had no notice of any differences between the Water Company and the city in 1902, and that as soon as the action of the City was brought to its notice it proceeded at once, under advice and approval of a committee of bondholders, to faithfully carry out the contract, and to that end had caused appointment of a Receiver, issuance of certificates and erection of a modern filter plant, and otherwise bettering the system. The answer concludes with a reference to the amendment to the original bill, which amendment was allowed and filed October 15th, 1903.

The answer of the Receiver to the Cross-Bill adopts the answer of the Trustee, and avers further that he was a civil engineer of experience in the renovation of water works, and since his appointment as Receiver he had, with the assistance of another competent and experienced consulting engineer, formulated plans to comply with the requirements of the contract, and to this end had erected an improved filter plant with a capacity of two million gallons of filtered water daily, and that he was then supplying the City with an ample quantity of pure and wholesome water.

The answer of the Water Company to the Cross-Bill is in substance what is set up in the answer of the Trustee, except that it states that while the extensions in the annex or new territory of the City began in 1898, and were completed to the satisfaction of the City in 1900, yet prior to 1898 the Company had extended pipe and established fire hydrants in the new territory without the guarantee of revenue under the contract.

The amendment to the original Bill alleged that it was the purpose of the Trustee and bondholders to take all necessary steps to comply in every respect with the contract, and, with the aid
101 of the court, to perform all the obligations of the Water Company under the contract; that it offers to the court to have all present and future income of the Water Company applied so far as necessary to betterments of the system, and to have further Receiver's certificates issued as, in the opinion of the court, may be necessary for perfecting in every way the system and complying in full with the contract. The amendment concludes with the prayer that the court as a court of equity will give such direction to the cause as to give effect to this avowed purpose of complainant and thereby save to the bondholders what constitutes security for their bonds.

To the original Bill as amended the City demurred on the grounds that the Bill as amended was without equity; that the amendment was not germane; that it appeared from the pleadings when this amendment is allowed, as well as from reference to the foreclosure proceedings as referred to in the original Bill, that the Water Company had failed in its contract; that no exclusive franchise was given the Company under the contract to supply water from any source except the one selected and by the system adopted; that no exclusive franchise for the use of the streets could be granted by the City for a term of years, and that the City had the right and was exercising its police power in adopting the ordinance providing for a bond election and the construction of its own system of water works.

The hearing *nisi* came on to be heard September 28th, 1903 (and from time to time thereafter under appropriate orders), the court having before him, before its conclusion, the amendment to the original Bill and the demurrers, on which argument was also had.

On November 19th, 1903, the court granted the application for the injunction *pendente lite* and entered an order of reference to the undersigned for full investigation and report upon all the questions of law and fact involved.

On December 8th, 1903, replication was duly filed, and on
102 the same date the court granted an order overruling the demurrers of the City to the original Bill, and also as amended, on each and every ground set forth.

On said last named date the court entered an order of reference to the undersigned of matters at issue in the Cross-Bill and answers thereto, for full investigation and report upon all of the questions of law and fact involved.

At this stage of the cause, as by the several pleadings set out, the case comes to the Master.

Pending the hearing under the reference of the cause, and the matters incident thereto, and before argument was had, but after taking of testimony had been concluded, the City on June 23rd, 1904, presented its petition to the court, praying for a dissolution of the injunction *pendente lite* and that the City be permitted to

erect its own system of water works. It was further prayed that the Receiver be directed to take such action as was possible to relieve the present alleged distressing conditions as to water supply in the City of Columbus. This petition alleged that since the grant of the temporary injunction and reference of the cause the reservoirs of the Water Company had failed and the same had been temporarily abandoned, and the Receiver was taking water from the Chattahoochee river; that at the points of intake there was contamination by sewage from thickly settled sections of the City; that the water now furnished by the Receiver was unfit for drinking and other domestic purposes, and because of the low stage of the river the supply was insufficient for fire protection; that the conditions were alarming, threatening the health of the people and the possible destruction of property by fire; that prompt action by the Receiver was needed for temporary relief, and to guard against its repetition the City prayed to be allowed to proceed to erect its own system of water works.

In answer to this petition the Trustee admits the allegations as to the status and progress of the hearing, but denies that the Receiver has abandoned the reservoirs, but states that he is using one fourth of the supply from that source, mixing same with three fourths from the river, and this was rendered necessary by
103 the unusual drought and that there is now a two weeks' supply of water in the reservoirs; that the river can supply ample water which is suitable for domestic purposes at the present low stage of water if boiled; that at the time the Receiver established the filter plant there was no sewer contamination above the point of intake; that there is ample fire protection and that the present status is only temporary, and in the natural course of events normal conditions will prevail; that there is no suffering now for want of drinking water as same can temporarily be found by the citizens from wells, springs and cisterns.

The hearing on this application and answer was set for June 25th, 1904, and after evidence submitted and argument, the Court granted an order dissolving the temporary injunction, but without prejudice to the rights of the respective parties on the merits of the case as it may be determined on final hearing. The Court notified counsel for both sides that the Master had been verbally directed by the Court to consider the report of the Receiver, and the evidence which had been submitted at this interlocutory hearing, and the Master, at the time argument was had before him, directed attention of counsel to this, as well as to certain analyses of the river water which the Court ordered to be taken and submitted to the Master.

By reason of reference having been asked, by counsel on both sides, to the foreclosure proceedings pending in this Court at the instance of the Trustee against the Water Company, the Master deems it proper that so much of the pleadings in that proceedings as may be applicable in this connection be herein referred to.

The bill for foreclosure was presented December 22nd, 1902. It sets up the existence of the trust deed of January 1st, 1891, given by the Water Company to the Trustee, and alleges that for more

than six months prior to the filing of the Bill the Water Company had, in violation of the terms of the trust deed, suffered the security of the bondholders to become impaired by not maintaining
104 and keeping its water works supplied with all equipments for providing water to the City and by not making proper additions, betterments and improvements to the works; that owing to unprecedented drought the sources of water supply had to large extent failed for the time being and that it was within the power of the Company to provide for such a contingency by seeking and availing itself of other sources of supply, but that owing to the attitude of the City, then taking steps to provide a water supply of its own, the Water Company was unable to sell its treasury bonds for that purpose; that the Company was about to default on the payment of interest on its bonds falling due on January 1st, 1903, by reason of large necessary expenditures incurred by it on account of a disastrous freshet occurring in the preceding February; that a majority of the bondholders, as provided in the trust deed, had requested the Trustee to proceed to have the same foreclosed and a Receiver appointed, and it was therefore prayed that a decree be entered against the Water Company for the principal and interest of the bonded indebtedness and that a Receiver be appointed and the relief granted as proper.

To this Bill the Water Company made answer December 22nd, 1902, in form of a resolution of its Board of Directors adopted December 22nd, 1902, admitting the allegations in the bill and consenting to appointment of a Receiver. A Receiver was appointed on this date and is operating the water works under direction of the court pending final decree.

105 *Findings of Fact.*

1.

On October 7th, 1881, a contract was entered into between the City of Columbus, Georgia, and Thomas R. White for the purpose of constructing and operating an effective system of water works for the supply of the City with water for the various uses required. At this time the City of Columbus as defined by its corporate limits extended along the Chattahoochee River upon a corporative level area, the northern boundary being Seventeenth Street. The adjacent territory east, north and west was and still is a rolling elevated country rising eighty feet or more above the level of the old City. As early as 1878 the City contemplated securing a water supply and negotiations were had to that end, materializing on September 20th, 1881, in the Council appointing a joint committee of aldermen and citizens who were authorized to enter into a contract for that purpose, and who, under this authority, executed the contract with White. Under this contract a system of water works was constructed, and on April 3rd, 1882, White, with the consent of the City, transferred and assigned his contract to the Columbus Water Works Company, which had been duly incorporated, White being one of the incorporators. On October 31st, 1882, the Company through its

President notified the Mayor and Council of the completion of the work under the terms of the contract and the assignment of the same by White. In this communication (Vol 1, page 288) the Company gave its assurance that the water supplied would be "wholesome, abundant and lasting." Acceptance of the works was asked.
106 This communication was laid before the Council at its meeting November 6th, 1882. Objection at that time was made by the City to the filters as constructed and White made a personal statement to the Council that the filter was an improvement on the one called for in the contract. The Mayor and Council thereupon, by formal resolution, expressed acceptance of the water works as completed according to the terms of the contract.

I find that this acceptance was based on the statement of the Water Company that the system had been completed in compliance with the contract and upon the assurances by the Company that the water would be wholesome, abundant and lasting.

2.

The contract contained Forty-Eight paragraphs, the substance of which are here given, the abstract being more full as to certain paragraphs on which there are direct issues between the parties. These last are paragraphs numbered I, III, IV, V, IX, X, XI, XII, XIII, XIV, XV, XXII, XXVII, XXVIII, XXIX, XL, XLV, and XLVIII. The mutual agreements were: White on his part was

I. To furnish and supply all real estate, rights of way, water rights and water that shall be required for successful prosecution and operation of the water works.

II. Supply buildings, dams, etc.

III. A storage reservoir with a storage and supply capacity of not less than 125 million gallons of water when filled, so lo-
107 cated that the surface of the water therein when full will stand at an elevation of not less than 100 feet above the floor of the market house and if practicable to have an elevation of 107 feet or more.

IV. A properly placed cast iron supply main from storage reservoir to the City of ample capacity, which in the beginning shall be of 12 inches internal diameter and shall supply the street mains at the pressure due to the elevation.

V. The distribution system in the City shall, in the beginning, consist of five (5) miles of street mains, of twelve (12), ten (10), eight (8), six (6) and four (4) inches, internal diameter, to be laid in such streets as Thomas R. White may select, with the consent of a special committee appointed by the City Council; particular reference being had to such a mode of distribution as shall give the greatest amount of fire protection to the City and the distribution of largest amount of water to consumers. The street mains shall be of the best cast iron, coated with coal tar varnish and capable of standing *d*ydrostatic pressure of three hundred pounds to the square inch.

VI. Thirty stop valves are to be provided at proper distances.

VII. On the five miles of street mains 50 double hydrants are to

be placed—giving 100 hose connections, which are to be 4 inches with 4½ inch water ways.

VIII. Provides for five public drinking fountains.

IX. The sizes of street mains shall be ample for supply to consumers and for fire protection through hydrants. The capacity for distribution and supply to various mains in streets to equal
108 sizes given in places for pipes, submitted to special committee of Council previous to execution of contract.

X. The source of water supply shall be determined by White, he guaranteeing, however, that the supply of water, both in quality and amount, shall be wholesome, constant and amply sufficient to meet the wants of the City and private consumers for future and present requirements.

XI. Within the storage reservoirs, and surrounding the supply main leading to the city, shall be constructed of masonry two circular concentric walls arranged in annular positions, about twelve (12) feet distant from each other, and having an internal diameter for the inner wall of from forty (40) to fifty (50) feet, the other having about twenty-four (24) feet greater diameter. These walls to form a structure for containing between them gravel, sand and filtering materials, through which all water supplied to the water mains shall pass before being distributed to the City.

XII. In constructing the storage reservoir all trees, stumps, roots, grass, alluvial deposits, vegetables and unwholesome matter shall be removed from the space to be occupied by water. Excavations and embankments shall be made about the margins of the reservoir such as will avoid all thin edges to the water, with reservoir filled, and cause marginal depths of not less than four (4) feet of water. After the completion of the reservoir, and the use of the water from the same by the City it shall be kept free from grass, weeds, vegetation of all kinds aquatic or otherwise; and all proper and reasonable provisions made for cleanliness and purity. The filtering
109 material surrounding the supply main shall be kept in good condition and cleanly.

XIII. Should the water supply to the distribution ever become contaminated or unwholesome, from any cause, upon notice being given by the proper City authorities, Thomas R. White agrees to make all provisions practicable for improving the quality, and if, at any reasonable time after such notice, the water supply is not of wholesome quality, to be determined by three scientific experts, one to be selected by the City, one by Thomas R. White, and the two to select a third, the City authorities may issue orders limiting its use, or the entire cutting off of the water from the street mains, and reserve the use for fire purposes only. The expenses of such experts and examination to be paid by Thomas R. White, or the City, which ever may be decided against, and if no decision, each to pay its expert and both to pay the third.

XIV. The Mayor and Council are to grant a franchise for the exclusive privilege of maintaining and operating the works for a period of thirty (30) years, or until such time as they may be pur-

chased by the City, and during such time to rent from Thomas R. White, the fifty (50) double fire hydrants at an annual rental of eighty (80) dollars each, equal to four thousand (4,000) dollars per year, payable quarterly; and on future extensions the rate shall be seventy-five (75) dollars per hydrant; but whenever the number of hydrants exceed ten (10) per mile, on any one mile of pipe, there shall be a discount of ten per cent. for each additional hydrant on said mile of pipe. In the primary distribution of the fifty hydrants in the line of street mains, reference shall be
110 had to the value of property contiguous, and a number of hydrants greater than ten may be placed on a mile of pipe without this reduction in price per hydrant until additional hydrants beyond fifty (50) are placed on the original five miles of pipe, when such reduction shall occur on one hydrant for each such addition.

XV. In order to make provisions for the payment of water rents, the Mayor and Council in making appropriations for the fire and sanitary departments, shall appropriate a sum sufficient to pay the annual rental of the water works, and the Mayor and Council shall receive in payment for any taxes due the City of Columbus the due coupons of any bond issued by Thomas R. White to an amount not exceeding the rental due by the City to him in any one year; and the coupons thus taken shall be received by him as cash in payment of said rentals.

XVI. Fixes a scale of charges.

XVII. Unlimited use to the City of water for certain public purposes, such as street sprinkling, engine practice, fountains, public buildings and like purposes for which it was to pay White an amount equal to annul taxes due the City by Water Company.

XVIII. Fixes rate City required to pay for water other than the above and other than that used for sanitary purposes and not otherwise provided for.

XIX. Fixes charges for keeping public cisterns filled.

XX. The City allowed to flush streets and sewers from fire hydrants at an agreed price to be stated, provided use not beyond capacity of the works to supply.

XXI. Right reserved by the City to the undisturbed use
111 of the four inch pipe connections and attachments located at the date of the contract on certain streets, such use to be for fire purposes only—to supply cisterns and engine practice—these pipes not to be used for other water supply or street sprinkling after the completion of the water works, except with consent of Company.

XXII. Should Thomas R. White find it necessary at any time to cut off the water from any or all of the supply mains, deductions in charges for water supplied be made, both to the City and consumers so deprived of its uses or benefit equal to double what would have been due during such time, to Thomas R. White, had not such interruption in supply occurred; provided that a temporary stoppage in the supply, not exceeding twelve (12) hours' duration, at any one

time, for the purpose of repairing, extending or tapping water mains shall not be considered an interruption for rebate.

XXIII, XXIV and XXV provide for depths of pipes in ground, uniformity of hydrants and valves, use of private fire hydrants and compensation therefor.

XXVI. After fifteen years from the date of acceptance of the works by the City, under the contract, if at that time the City does not become the purchaser of the works, the annual rental on fire hydrants on all future extensions was to be reduced to one half the prices now agreed upon, the original rates to remain on the distribution existing at that date.

XXVII. Whenever the consumption of water on the line of any street main is so great as to reduce the pressure between the hours of nine (9) and ten (10) o'clock A. M. and one (1) and two (2) o'clock P. M. below thirty-two pounds to the square inch, said water mains shall be deemed of insufficient capacity and shall be
112 replaced by Thomas R. White with pipes, mains or connections of sufficient size to give the pressure above named—the level of the market house floor to be taken as the index for levels and pressures. No water main of less than four (4) inches diameter shall be used in the distribution system.

XXVIII. Thomas R. White obligates himself to extend mains whenever he shall be assured of a permanent annual income of $700 per mile of pipe, or $150 a year on a line of 1,000 feet, or $100 on a line of 600 feet. These incomes when the pipes laid may be of four (4) inches in diameter, with fifty (50) per cent. additional assurance income when six (6) inches is to be laid, either direct- or indirectly, to supply the same in length not exceeding those mentioned.

XXIX. The fire hydrants shall be located along the streets where the pipes are lain, and their location shall be with the approval of a special committee appointed by the Council.

XXX and XXXI respectively relate to subject matter of location of fire hydrants (to be done under approval of committee of Council), interferences in the construction, with gas pipes, sewers, etc., and relaying water pipes.

XXXII, XXXIII, XXXIV, XXXV and XXXVI give to White the right to occupy the streets of the City for constructing the system, having due regard for the public safety and convenience; he is to repair all damages to the streets, other than caused by negligence of City employees, and is to hold the City harmless of all damages arising in work of construction and is to restore the streets to as good condition at completion of the works as they were before work began.

113 XXXVII and XXXVIII forbid the use of public water for private purposes, and the City agrees to protect by legislation the hydrants and valves.

XXXIX. The City is to aid in procuring such additional State and municipal legislation as may be required to protect the rights and property of Thomas R. White.

XL. The proposed works shall be built in the most substantial manner and of the best materials, and on such a scale as to permit

the extension of the pipes and an enlarged supply for the public without remodeling or altering the machinery or street mains for many years to come under ordinary conditions.

XLI. Refers to supplying certified copies of the contract to White by the City.

XLII. It is provided that at the end of fifteen years from the completion of the works the City shall have the right to purchase the same with all the rights, franchises and property at a price to be mutually agreed upon, or the valuation may be ascertained by three disinterested non-residents of Columbus or Muscogee county, one to be a hydraulic engineer—the City to appoint one arbitrator, White one, and these two to select a third. When the value of the works is thus ascertained and declared, the City shall pay the sum named with ten (10) per cent. added; and the City shall, in this purchase, assume all the obligations of White, the lawful acquittances of which shall be received by White as a part of the cash payment of the declared value of the water works. The obligations include such as are for operating, maintaining and extending the same, and the duties incident thereto. In assuming money obligations for
114 indebtedness, or choses in action, due from White to others, the same shall be in lieu of cash payments to equal amounts, and no obligation to assume money liabilities greater than the value to be paid by the City; but the City has the right to decline the purchase after the value is ascertained upon payment of expenses of arbitration. If the City does not buy on this valuation when ascertained the right and privileges of White shall continue in force until the final purchase of the works by the City. The right to purchase shall enure to the City every 15 years, but in every case White is to have 12 months previous notice of the City's intention to purchase.

XLIII and XLIV refer to right of White to cut off the water from consumers when the plumbing is defective, and to right of City to order the water cut off from use of private consumers when the same, in its use, is permitted to become obnoxious, stagnant, putrid or unclean.

XLV. In the execution of this contract by Thomas R. White, should the gravity system contemplated be found impracticable, either owing to natural causes, objections or unreasonable requirements of land owners regarding the right of way for the pipes leading to the City, a well constructed secondary or distributing reservoir may be used of not less than 3,000,000 gallons capacity, and two full system of pumps, operated by either water or steam power, may be used for elevating water from the storage to the distributing reservoir, such pumps to be first-class, of easy capacity, of not less than 1,500,000 gallons daily, to be capable of being worked separately or together; pumping connections between reservoirs to be twelve inches or more and proper valves and attachments used; filtering arrangements in storage reservoir, as heretofore described. The ele-
115 vation of this distributing reservoir to be not less than twenty feet above storage reservoir. Such distributing reservoir to be kept well supplied with water, in good condition in every way,

and all arrangements consequent to distributing reservoir being used and adopted shall be provided by Thomas R. White.

XLVI. White is to begin work within twenty days after City ratifies the contract and is to continue the same without interruption (except for Providential cause) with a view of a full operation of the works by May 1st, 1882. He is to procure all necessary real estate, water rights, etc., and proceed without delay to build a storage and if necessary a distributing reservoir. Within two months he is to ship the supply main, or a named number of feet thereof.

XLVII. If the work is not *bona fide*, commenced within thirty days from execution of the contract, or not completed prior to June 1st, 1882, all rights vested in White by the City under the contract shall revert to the City and all property and rights procured by him for building the works should be forfeited to the City, and all damage done by White to property, public or private, by reason of the incomplete works, shall be repaired at White's expense.

XLVIII. Should natural causes or unavailable requirements of owners of real estate required in construction render the building of a storage reservoir at an elevation above 110 feet impracticable, then, if deemed expedient, Thomas R. White may adopt what is known as the Holly system of water works in lieu of other system. In this event a storage reservoir of not less than fifty million gallons capacity shall be provided—pumps and boilers of ample capacity in
116 duplicate. Arrangements shall be made for domestic pressure, equal to not less than that due to 100 feet elevation, and a fire pressure of not less than that due to 150 feet. Direct electric communication from fire alarm station of City to pump house, with proper arrangements for early fire pressure in case of alarm. As far as this system can be made to conform with provisions hereinbefore set forth it shall be so done in the use of the Holly system.

In connection with the foregoing must be considered the terms of a supplemental agreement between the Water Company and the City made June 1st, 1898, and finally consummated May 3rd, 1900. (See Head 5 of this report under Findings of Fact.)

3.

White, together with the Water Company, his assignee, selected a source of water supply on hills in the State of Alabama four miles west of the City, constructed a reservoir and conveyed the water through a twelve-inch main into the City across one of the bridges owned by the City which spanned the Chattahoochee river; permission was given by the City to cross this bridge, and the water when so conveyed was, in the beginning, distributed through five miles of mains, as described in the original contract. The works were put in operation November 6th, 1882. The method of construction of the reservoir and distribution system will hereinafter be fully set out, together with the facts as to extensions and enlargements.

117 4.

On September 1st, 1886, a resolution of the City Council was adopted calling attention of the Water Company to the insufficient

supply of water and unwholesome quality thereof, and the requirements of Sections 10, 11 and 13 of the contract. In reply to this, the water committee of Council reported that the President of the Water Company had been notified and expressed an intention of correcting the evils complained of.

On April 6th, 1887, the Committee on Fire Department and Water Works reported to Council (Vol. 1, page 38) that under a test made by the Superintendent of the Water Company and the committee the water pressure on the street mains was lower than the minimum fixed by the contract. Council withheld the water rentals.

On January 12th, 1888, the Water Company promised Council that it would take immediate steps to restore the pressure on the mains to the required pressure.

On April 4th, 1888, the Water Company petitioned Council to rescind a resolution which had been adopted April 6th, 1887, requiring the Company to remove their pipes from the upper bridge; also to be permitted to erect a standpipe before September 1st following, to be of 120 feet elevation and proper proportion at its base. Council rescinded the resolution and granted permission to erect a standpipe, the Company having stated that its object in erecting a standpipe was to add to the pressure on the mains and have an additional water supply in case of casualty.

On June 5th, 1888, the record shows that differences with the Water Company had been arranged and all water rentals
118 which had been withheld were ordered paid.

On July 16th, 1889, Council records show that there had been marked improvements in the water service. (Vol. 1, pages 305-308.)

I find that the system as accepted by the City in 1882 had not met the general requirements of the contract, and that on complaints to the Company the system had been improved to such an extent that in 1889 the service at that time was accepted as satisfactory to the City.

5.

In 1886 the City was enlarged by the annexation of a square mile of territory north and east of the old city and designated as the Annex, the elevation of which was considerably above the level of the old city. The Annex was composed of residence sections known as Rose Hill and East Highlands. This territory all lay north of Seventeenth Street, except a small portion in the southeast part. Annexation of the above territory presented a question evidently not in contemplation of the parties in 1882, but nothing is shown by the evidence that any steps were taken by either party to the contract to supply water to the new territory at the time of annexation. In 1891 the Chief of the Fire Department of the City reported that the Water Company had extended its mains on Third Avenue to Twentieth Street, which is north of Seventeenth Street, and from experiments made, water to the height of 20 feet had been obtained. He recommended that fire hydrants be placed at certain specified localities in this new territory. (Vol. 1, p. 298.) On March 1st, 1893, the City Council by unanimous vote appointed a joint committee of

citizens and from Council to make investigation and report
119 on the necessities of the City for water supply, method of supply, cost thereof, and means for raising funds for the purpose.

On April 5th, 1893, the City, by resolution, submitted to the Water Company the question as to whether the present Company could supply water to the annex and such other portions of the City as were without water; and whether and upon same terms to the annex as the present contract, and if not, upon what terms and in what time. To this the Company replied April 13th, 1893, that it had two reservoirs with a joint capacity of 145,000,000 gallons, and the upper reservoir with an elevation of 146 feet above the level of the old city, and that it had purchased ground for an additional reservoir of 400,000,000 gallons and additional springs of supply, and could supply all water needed; that it could supply this in accordance with the terms of its contract with the City; that it could give sufficient quantity and pressure to cause the water to flow freely into fire engines and such domestic pressure as to furnish houses, and would build another standpipe if necessary, and that the time required would depend upon the amount of work to be done. This matter was again referred to the joint committee of Aldermen and citizens.

On November 9th, 1893, the joint committee of Council to whom was referred the resolutions of March 1st and April 5th, 1893, reported in substance—that over one-half of the area of the City was without a water supply except from wells; that the annex was without water under pressure; that the pressure from the present works supplying the old City was too low, the maximum being 45 pounds; that municipal ownership was desirable; that the City should
120 issue bonds and build its own works; and that a new system be adopted. With this report was an elaborate report of an expert hydraulic engineer giving full details of the present and proposed system. (Vol. 1, page 490.) The general tenor of this report condemned the then existing works as inadequate and inefficient. It will be referred to again hereafter.

On April 30th, 1894, the Water Company, in reply to a committee from Council requesting the present Company to say if it could furnish water to the annex, stated that it would build a standpipe in the annex and extend main thereto if the City would order same and agree to pay $75.00 for each annual rental for 18 hydrants. This communication stated that the Company could not guarantee any specific pressure for these new hydrants, but there would be sufficient pressure to feed fire engines and cause water to flow in the second story of houses. This reply was laid before Council. No action was taken thereon, but Council on May 2nd, 1894 (Vol. 1, page 198), again appointed a joint committee of citizens and Aldermen to confer with the Water Company and call its attention to the report of November 9th, 1893, and that of the hydraulic expert, and ascertain if the Company would make proposed changes or enter into a new contract, and if not, on what terms it would sell its present system to the City. It was resolved that if no satisfactory agreement could be

reached with the old Company, Council would take steps to erect a new system.

On September 10th, 1894, the joint committee last above referred to reported, laying before Council a volume of correspondence which had been had between the committee and the Water Com-
121 pany, the substance of which was on the part of the City a demand for water in the annex, and upon what terms and conditions would the Water Company supply same, and on the part of the Company that it had found it difficult to get its Board of Directors together, but the President of the Company replying, refers to his previous communication of April 30th, 1894, and furthermore states that if the City consents to a new contract and would relieve the Company of unreasonable complaints of defects not admitted as existing, the Company would make a new storage reservoir and give a pressure of 90 pounds, and thereby giving a pressure of 40 pounds in the annex; would also agree to take up all 4 inch mains, and replace with 6 inch mains if Council would guarantee the additional income as by contract. He also stated that the Company would consent to a new contract as to modification of charges. This correspondence covers dates from May 7th to August 16th, 1894. (Vol. 1, pages 400 to 417.) The report was received, but an ordinance was introduced, and at the next meeting of the Council adopted, providing for an election and bond issue with which to construct a new system of water works. The ordinance repudiated the contract of October 7th, 1881, and declared that if the Water Company desired to furnish the City of Columbus with water it must make a new contract with the City. The basis of the ordinance as recited in the preamble was that the existent contract when made had not been submitted to a vote of the qualified voters of the City. With reference to the proposition to sell, the President replied that he would call the Directors of the Company together and submit the
122 matter. It does not appear that this was ever done.

On October 3rd, 1894, Council adopted a resolution confirming its former action in repudiating the contract and setting out further reasons for having done so; especially in that the Water Company had failed to propose to remedy defects in the system; further that the present system was inadequate in quantity and pressure for present and prospective needs of the City; further that it was impracticable for the annex to be supplied from the present system, and that the Company had violated the contract of 1881 in not complying with Sections 3, 10, 11 and 12 and in other respects.

On November 26th, 1894, the Water Company by letter of date of November 10th, through its Secretary and under order of its Board of Directors, proposed to adjust all differences between the City and Company and provide for future demands; an offer was made to furnish all water and pressure needed by the City both in the old and new portions thereof. The Company proposed to arbitrate all differences, the judgment of the arbitrators not to be appealed from, and it was proposed by this arbitration to include the final settlement of the question of pressure, amount of water, price to City and consumers and extension of the system into the annex.

Council rejected the proposition on the ground that an ordinance had been passed providing for an election; that there was nothing to arbitrate and that all such contracts for more than one year should, under the law, be submitted to popular vote.

On December 10th, 1894, the election on the ordinance to
123 issue bonds resulted in a vote of 1110 in favor and 765 against the issue; the measure being lost for want of the requisite two-thirds majority.

On December 23rd, 1894, Council adopted a resolution expressing what it believed to be its needs as to water, which fully stated were: A reservoir of five hundred million gallon capacity; a conduit pipe of 24 inches diameter; a minimum pressure on level of old city of 75 pounds and an annex of 45 pounds; proper filtration; distributing pipes of not less than 8 inches and abolishment of dead ends; a daily supply of 4 million gallons; the regulation of the use of water by police authority and not by meters; that the price of water was too high and the amount per capita too low; certain stipulated prices were named and that not recognizing the present contract as of force after January 1st, 1895, the Water Company was requested to say whether it desired to furnish water to the City on the terms as above set out. To this the Company on January 2nd, 1895, replied that it would not admit it had no contract with the City, and that on points complained of Council should have given the Company a hearing. It expressed a willingness to accept any reasonable modification of the contract that would bring the City to a better understanding; that the pressure could be obtained through pumps, either by erection of a standpipe at the highest point in the annex or by reservoir; it stated that 4 inch distributing pipes were too small and the present owners had not installed less than 6 inch pipe; it proposed to put itself in position to give the City a potential supply of four million gallons daily either by pump or a new reservoir; it admitted the City needed more water and proposed to extend the system both in
124 the old city and in the annex on the same terms the old city was to be supplied; it proposed to add to the fire hydrants in lines already in for an agreed price and to charge $40.00 per hydrant annual rental on all extensions; to increase the amount of water per capita and to revise, after conference with the City authorities, the water rates, and to furnish, if desired, a pressure of 75 pounds at the market house and 45 pounds in the annex for fire protection. It does not appear that any action was taken on this proposition.

On November 27th, 1895, Council adopted a resolution directing its City Engineer to make estimate of the water in the reservoirs and report their condition. A committee was appointed to assist him.

On December 4th, 1895, Council adopted a resolution to notify the Water Company that after 1895 a new agreement as to water would have to be made. At this meeting the special committee appointed to ascertain with the City Engineer the conditions of the water supply reported the Engineer's findings—to the effect that the upper reservoir contained no available water, and that the lower reservoir, with a capacity of 13,287,435 gallons, then had a fraction over 7,000,000 gallons. (Vol. 1, page 435.)

On January 1st, 1896, Council appointed a committee to confer with the Water Company and report what agreement could be made as to a water supply, price, length of contract, etc.

On April 1st, 1896 (Vol. 1, page 439), was submitted correspondence from the Water Company to Council (covering dates from March 4th to March 23rd, 1896) proposing to extend system to annex, erect standpipe, therein provided City would pay rentals
125 on hydrants as in old City; also connect up dead ends, thereafter lay only 6-inch mains, remove all fire hydrants from 4-inch mains, properly reconstruct upper reservoir, and take in new spring for water supply, and begin and complete work as early as practicable; the proposed changes would give 60 pounds pressure generally and no less than 30 pounds in the annex; that if this proposition was not accepted the Company was ready to carry out any former propositions made, provided the City, by such acceptance, would consider same a final settlement of the water supply for the City, and the present contract in force till its expiration. (Vol. 1, page 443.)

It appears (Vol. 1, page 444), that this proposition was acceptable to the City except the last clause as to recognizing the existing contract. In reply to this the Company stated that unless the City would give some assurance of permanency to the agreement the Company could not dispose of its securities reserved for purposes of extension. It does not appear that any conclusions were reached.

In February, 1897, the City ordered, and there was held, another election by the people on an ordinance proposing the issuance of bonds by the people for erection of water works, the proposed issue again failing because of the requisite two-thirds majority.

On June 1st, 1898, a committee of Council appointed at the preceding April meeting to obtain from the Water Company acceptance of a proposition to extend the system to those parts of the City not then provided with water, reported a formal proposition from the Water Company, and the same was unanimously accepted on recommendation of the committee.

126 On April 4th, 1900, the Company notified Council that it had complied with the proposition. A special committee of Council reported that the work had been examined and test of pressure made and found satisfactory, but that all the conditions had not been fully complied with. The omissions were specified and a special committee appointed to confer with the Company.

On May 3rd, 1900, the special committee reported, and again on June 6th, 1900, after further investigation made report, Council adopting same. This proposition finally accepted as between the City and Water Company is set out in substance as follows: (Vol. 1, pages 316-328.)

1. Lay off the City into two water districts, known as upper (or Rose Hill) District and Down Town Districts, with Fourteenth Street as dividing line.

2. Supply upper district from Rose Hill standpipe and lower with Broad Street standpipe, the two districts to be connected with proper

valves at No. 1 Engine House so as to connect or disconnect the two systems as occasion required, the valves to be in control of City.

3. The base of Rose Hill standpipe to be 90 feet above level of market house, and pipe to be 120 feet high, making total of 210 feet elevation.

4. A pump to be installed with capacity to fill Rose Hill standpipe and keep it filled; a *guage* to be placed at standpipe under City's control. In emergency pumping is to be directly in the mains.

5. The City to pay for this additional service $2,000 per annum, the Company to supply 50 additional hydrants in old or new part of City as City designates, and these to be exclusive of 100
127 hydrants to be furnished in old city, making total of 250 fire hydrants.

6. No pipe less than six inches diameter to be laid and two six inch mains to connect the main from Seventeenth Street with Rose Hill standpipe.

7. Payment by City to begin from April 4th, 1900.

8. Test of pressure as detailed to be made, the pressure to show not less than 40 pounds through two lines attached to double hydrants.

On July 16th, 1902, the City requested the Board of Health to have an analysis made of the water of the Water Company. The Mayor submitted a message in substance that the present water system is unprepared to furnish a constant and sufficient supply of wholesome water to the City; that in view of failure of proper service by the Water Company, the City had withheld payment of water rentals due July 1st, 1902, pending an investigation as to legal rights of the City, and until adjustment could be made and an agreement be obtained from the Company to lay larger conduits from the reservoir, and larger mains in the City where needed, construct a proper filter plant and make such other additions necessary to furnish proper service for which the Company has been demanding and receiving payment. Council then adopted a resolution to the effect that it was the sense of Council that the City should construct and own its own system, and an ordinance for a bond issue was on September 14th, 1902, authorized, (Vol. 1, page 445.) Subsequently Council adopted an ordinance providing for the bond issue as set out in the Bill of complaint, the same having been ratified by a popular vote December 4th, 1902, in which the vote was 1640 for and 7 against
128 the bond issue. These bonds were validated as provided by law and were being advertised for sale by the City when the Bill in this cause was filed. Council in 1902 procured the passage of an Act of the General Assembly (Acts 1902, page 370) authorizing the City to construct and own and operate its own water works system and establish a Board of Water Commissioners for that purpose; said Board was subsequently established. The recitals in the preamble of the ordinance of September, 1902 stated that the Water Company had totally failed to supply the City with a sufficient quantity of pure and wholesome water and that the public health was paramount and public ownership would conduce to great saving in cost of water to the City.

I find that from 1889 to May, 1900, except at comparatively short intervals, there was dissatisfaction and complaints on the part of the City because of insufficiency of the water supply, and especially with the unsupplied needs of the City for water in its annexed territory; that the Company had notice of this and recognized the necessity of increased supply. I further find that during this period the differences between the Company and the City led to an effort by the Council on two separate occasions to repudiate the contract, but that it was not sustained by the requisite popular vote, thereby indicating the desire of the people to give to the Company an opportunity to carry out the terms of the contract; that the Company in apparent good faith endeavored to adjust the differences by offer to arbitrate and the Council declined, and that finally the Council accepted existing conditions and concluded a supplemental agreement by
129 which the Company was given an opportunity to test its ability to fully meet the requirements of the contract; and that in 1902 both the Council and the people determined to no longer depend upon the Water Company.

6.

Under Paragraph X of the contract the original contractors selected as a source of water supply a point four miles west of Columbus, in Alabama, and thereon constructed what is designated the lower reservoir. This reservoir covers an area of 3.85 acres; has an average depth of 9.5 feet, and a storage capacity of 12,078,000 gallons. It has a rock bottom, marginal depths of 4 feet properly walled, and is free from trees, stumps, roots, grass and alluvial deposits and vegetable and unwholesome matter. The water originally flowed directly into this reservoir from what was known as Holland creek, entering from the north, being an ordinarily clear water stream except in stormy weather. The water is drawn from this reservoir by a cast-iron conduit of internal diameter of 12 inches, being held in reserve by a stone dam 20 feet high. In the bottom of the reservoir underground springs supplemented the supply from the creek. The elevation of this reservoir at top of dam is 117 feet above the floor of the City Market.

In 1885 the Company constructed a second or Upper Reservoir immediately north of the Lower Reservoir, separating the two by a stone dam partially across the south end of the Upper Reservoir. The remaining support is a dirt embankment. This was intended for a storage or settling reservoir into which the water flowed from the two prongs of the creek known as the East and West
130 prongs; from there it was allowed to flow directly over the top of the dam into the lower reservoir. In 1889 a by-pass was constructed on the west side of the two reservoirs by which storm water was conducted around and below the lower dam. This upper reservoir originally covered an area of 17.1 acres and had a capacity of 39,392,000 gallons, with the exception of the south end, which is partially occupied by the stone dam, the excavations and embankments were not made about the margins so as to avoid thin edges and provide a marginal depth of four (4) feet. This reservoir

has not been kept free from grass, weeds and alluvial deposits, but from the first has been allowed to become in a great measure filled and remain with such deposits, and no proper and reasonable methods for cleanliness and purity have been maintained. As long as the supply streams are in normal condition and the reservoirs are kept full, or reasonably so, clear and comparatively pure water can be obtained. With the construction of the by-pass an arrangement was made to draw all water from the upper reservoir from or near the top of the surface through a main extending around the west end of the dam and into the lower reservoir. This is controlled by gates to shut off the water when unfit for flow into the lower reservoir. This arrangement is of no avail when the water is low. A 12 inch main extends from the upper reservoir directly into the supply conduit below the lower reservoir to be used in emergency to increase the water supplied to the main conduit. It is controlled by a check valve. When the streams become abnormally low the lower and the upper reservoirs are not properly supplied, and the water be-
131 coming stagnant it is impure and the source of supply greatly limited. These conditions existed to a marked extent in 1894 and 1895, and again in 1898 and 1899, and notably so in 1902. In the last named year the supply failed entirely in both upper and lower reservoirs. This occurred again in 1904 pending the operation of the works by the Receiver, and in 1903 he was frequently compelled to supplement the reservoir supply with river water. On the occasions of entire failure resort was had to water from the Chattahoochee River as the only source of supply. The total capacity of the reservoirs (which should be treated as one) was in 1890 estimated by a competent hydraulic engineer to be twelve million gallons for the lower and forty million for the upper reservoir, making total of fifty two million gallons. In 1893 the capacity of the two was ascertained by actual measurement to be 51,470,000 gallons, and at the time of the taking of testimony in this hearing the capacity was estimated at fifty-one million. The upper reservoir has sloping sides to the west and east and is open at the north. The alluvial deposits from the two inflowing streams have practically lowered the depth and forced the water to rise on the sides into shallow depths and thin edges. When the water fails, as in the years before named and at all times of prolonged drought, which is not infrequent in this section, the bottom of the reservoir exposes to the action of the sun and air considerable areas of mud impregnated with decaying vegetable matter. Photographs of the two reservoirs are in evidence and also a diagram. (Vol. 1, 310, 312, also page 490. Hall report plate II.)

I find that the water Company has at no time complied with Section III requiring a reservoir of 125 million gallons avail-
132 able capacity, and from 1884 it has failed to comply with the requirements of Section XII as to the construction and maintenance of the reservoirs.

7.

At the south end of the lower reservoir, at the point of intake of water for the supply main, is located a contrivance which acts as a

ct its own system of water works. It was further prayed that
e Receiver be directed to take such action as was possible to relieve
e present alleged distressing conditions as to water supply in the
y of Columbus. This petition alleged that since the grant of
e temporary injunction and reference of the cause the reservoirs
the Water Company had failed and the same had been tem-
rarily abandoned, and the Receiver was taking water from the
attahoochee river; that at the points of intake there was con-
mination by sewage from thickly settled sections of the City; that
e water now furnished by the Receiver was unfit for drinking
d other domestic purposes, and because of the low stage of the
er the supply was insufficient for fire protection; that the con-
ions were alarming, threatening the health of the people and the
ssible destruction of property by fire; that prompt action by the
eceiver was needed for temporary relief, and to guard against its
petition the City prayed to be allowed to proceed to erect its own
stem of water works.

In answer to this petition the Trustee admits the allegations as
the status and progress of the hearing, but denies that the Re-
iver has abandoned the reservoirs, but states that he is using one
urth of the supply from that source, mixing same with three
fourths from the river, and this was rendered necessary by
3 the unusual drought and that there is now a two weeks' sup-
ply of water in the reservoirs; that the river can supply am-
e water which is suitable for domestic purposes at the present low
age of water if boiled; that at the time the Receiver established the
ter plant there was no sewer contamination above the point of
take; that there is ample fire protection and that the present
atus is only temporary, and in the natural course of events normal
nditions will prevail; that there is no suffering now for want of
rinking water as same can temporarily be found by the citizens
om wells, springs and cisterns.

The hearing on this application and answer was set for June 25th,
904, and after evidence submitted and argument, the Court granted
n order dissolving the temporary injunction, but without prejudice
the rights of the respective parties on the merits of the case as it
ay be determined on final hearing. The Court notified counsel
r both sides that the Master had been verbally directed by the Court
consider the report of the Receiver, and the evidence which had
een submitted at this interlocutory hearing, and the Master, at the
me argument was had before him, directed attention of counsel to
is, as well as to certain analyses of the river water which the Court
rdered to be taken and submitted to the Master.

By reason of reference having been asked, by counsel on both
des, to the foreclosure proceedings pending in this Court at the in-
ance of the Trustee against the Water Company, the Master deems
proper that so much of the pleadings in that proceedings as may
e applicable in this connection be herein referred to.

The bill for foreclosure was presented December 22nd, 1902. It
ets up the existence of the trust deed of January 1st, 1891, given
y the Water Company to the Trustee, and alleges that for more

than six months prior to the filing of the Bill the Water Company had, in violation of the terms of the trust deed, suffered the security of the bondholders to become impaired by not maintaining
104 and keeping its water works supplied with all equipments for providing water to the City and by not making proper additions, betterments and improvements to the works; that owing to unprecedented drought the sources of water supply had to large extent failed for the time being and that it was within the power of the Company to provide for such a contingency by seeking and availing itself of other sources of supply, but that owing to the attitude of the City, then taking steps to provide a water supply of its own, the Water Company was unable to sell its treasury bonds for that purpose; that the Company was about to default on the payment of interest on its bonds falling due on January 1st, 1903, by reason of large necessary expenditures incurred by it on account of a disastrous freshet occurring in the preceding February; that a majority of the bondholders, as provided in the trust deed, had requested the Trustee to proceed to have the same foreclosed and a Receiver appointed, and it was therefore prayed that a decree be entered against the Water Company for the principal and interest of the bonded indebtedness and that a Receiver be appointed and the relief granted as proper.

To this Bill the Water Company made answer December 22nd, 1902, in form of a resolution of its Board of Directors adopted December 22nd, 1902, admitting the allegations in the bill and consenting to appointment of a Receiver. A Receiver was appointed on this date and is operating the water works under direction of the court pending final decree.

105 *Findings of Fact.*

1.

On October 7th, 1881, a contract was entered into between the City of Columbus, Georgia, and Thomas R. White for the purpose of constructing and operating an effective system of water works for the supply of the City with water for the various uses required. At this time the City of Columbus as defined by its corporate limits extended along the Chattahoochee River upon a corporative level area, the northern boundary being Seventeenth Street. The adjacent territory east, north and west was and still is a rolling elevated country rising eighty feet or more above the level of the old City. As early as 1878 the City contemplated securing a water supply and negotiations were had to that end, materializing on September 20th, 1881, in the Council appointing a joint committee of aldermen and citizens who were authorized to enter into a contract for that purpose, and who, under this authority, executed the contract with White. Under this contract a system of water works was constructed, and on April 3rd, 1882, White, with the consent of the City, transferred and assigned his contract to the Columbus Water Works Company, which had been duly incorporated, White being one of the incorporators. On October 31st, 1882, the Company through its

President notified the Mayor and Council of the completion of the work under the terms of the contract and the assignment of the same by White. In this communication (Vol 1, page 288) the Company gave its assurance that the water supplied would be "wholesome, abundant and lasting." Acceptance of the works was asked.
105 This communication was laid before the Council at its meeting November 6th, 1882. Objection at that time was made by the City to the filters as constructed and White made a personal statement to the Council that the filter was an improvement on the one called for in the contract. The Mayor and Council thereupon, by formal resolution, expressed acceptance of the water works as completed according to the terms of the contract.

I find that this acceptance was based on the statement of the Water Company that the system had been completed in compliance with the contract and upon the assurances by the Company that the water would be wholesome, abundant and lasting.

2.

The contract contained Forty-Eight paragraphs, the substance of which are here given, the abstract being more full as to certain paragraphs on which there are direct issues between the parties. These last are paragraphs numbered I, III, IV, V, IX, X, XI, XII, XIII, XIV, XV, XXII, XXVII, XXVIII, XXIX, XL, XLV, and XLVIII. The mutual agreements were: White on his part was

I. To furnish and supply all real estate, rights of way, water rights and water that shall be required for successful prosecution and operation of the water works.

II. Supply buildings, dams, etc.

III. A storage reservoir with a storage and supply capacity of not less than 125 million gallons of water when filled, so lo-
107 cated that the surface of the water therein when full will stand at an elevation of not less than 100 feet above the floor of the market house and if practicable to have an elevation of 107 feet or more.

IV. A properly placed cast iron supply main from storage reservoir to the City of ample capacity, which in the beginning shall be of 12 inches internal diameter and shall supply the street mains at the pressure due to the elevation.

V. The distribution system in the City shall, in the beginning, consist of five (5) miles of street mains, of twelve (12), ten (10), eight (8), six (6) and four (4) inches, internal diameter, to be laid in such streets as Thomas R. White may select, with the consent of a special committee appointed by the City Council; particular reference being had to such a mode of distribution as shall give the greatest amount of fire protection to the City and the distribution of largest amount of water to consumers. The street mains shall be of the best cast iron, coated with coal tar varnish and capable of standing *d*ydrostatic pressure of three hundred pounds to the square inch.

VI. Thirty stop valves are to be provided at proper distances.

VII. On the five miles of street mains 50 double hydrants are to

be placed—giving 100 hose connections, which are to be 4 inches with 4½ inch water ways.

VIII. Provides for five public drinking fountains.

IX. The sizes of street mains shall be ample for supply to consumers and for fire protection through hydrants. The capacity for distribution and supply to various mains in streets to equal
108 sizes given in places for pipes, submitted to special committee of Council previous to execution of contract.

X. The source of water supply shall be determined by White, he guaranteeing, however, that the supply of water, both in quality and amount, shall be wholesome, constant and amply sufficient to meet the wants of the City and private consumers for future and present requirements.

XI. Within the storage reservoirs, and surrounding the supply main leading to the city, shall be constructed of masonry two circular concentric walls arranged in annular positions, about twelve (12) feet distant from each other, and having an internal diameter for the inner wall of from forty (40) to fifty (50) feet, the other having about twenty-four (24) feet greater diameter. These walls to form a structure for containing between them gravel, sand and filtering materials, through which all water supplied to the water mains shall pass before being distributed to the City.

XII. In constructing the storage reservoir all trees, stumps, roots, grass, alluvial deposits, vegetables and unwholesome matter shall be removed from the space to be occupied by water. Excavations and embankments shall be made about the margins of the reservoir such as will avoid all thin edges to the water, with reservoir filled, and cause marginal depths of not less than four (4) feet of water. After the completion of the reservoir, and the use of the water from the same by the City it shall be kept free from grass, weeds, vegetation of all kinds aquatic or otherwise; and all proper and reasonable provisions made for cleanliness and purity. The filtering
109 material surrounding the supply main shall be kept in good condition and cleanly.

XIII. Should the water supply to the distribution ever become contaminated or unwholesome, from any cause, upon notice being given by the proper City authorities, Thomas R. White agrees to make all provisions practicable for improving the quality, and if, at any reasonable time after such notice, the water supply is not of wholesome quality, to be determined by three scientific experts, one to be selected by the City, one by Thomas R. White, and the two to select a third, the City authorities may issue orders limiting its use, or the entire cutting off of the water from the street mains, and reserve the use for fire purposes only. The expenses of such experts and examination to be paid by Thomas R. White, or the City, which ever may be decided against, and if no decision, each to pay its expert and both to pay the third.

XIV. The Mayor and Council are to grant a franchise for the exclusive privilege of maintaining and operating the works for a period of thirty (30) years, or until such time as they may be pur-

chased by the City, and during such time to rent from Thomas R. White, the fifty (50) double fire hydrants at an annual rental of eighty (80) dollars each, equal to four thousand (4,000) dollars per year, payable quarterly; and on future extensions the rate shall be seventy-five (75) dollars per hydrant; but whenever the number of hydrants exceed ten (10) per mile, on any one mile of pipe, there shall be a discount of ten per cent. for each additional hydrant on said mile of pipe. In the primary distribution of the fifty hydrants in the line of street mains, reference shall be
110 had to the value of property contiguous, and a number of hydrants greater than ten may be placed on a mile of pipe without this reduction in price per hydrant until additional hydrants beyond fifty (50) are placed on the original five miles of pipe, when such reduction shall occur on one hydrant for each such addition.

XV. In order to make provisions for the payment of water rents, the Mayor and Council in making appropriations for the fire and sanitary departments, shall appropriate a sum sufficient to pay the annual rental of the water works, and the Mayor and Council shall receive in payment for any taxes due the City of Columbus the due coupons of any bond issued by Thomas R. White to an amount not exceeding the rental due by the City to him in any one year; and the coupons thus taken shall be received by him as cash in payment of said rentals.

XVI. Fixes a scale of charges.

XVII. Unlimited use to the City of water for certain public purposes, such as street sprinkling, engine practice, fountains, public buildings and like purposes for which it was to pay White an amount equal to annul taxes due the City by Water Company.

XVIII. Fixes rate City required to pay for water other than the above and other than that used for sanitary purposes and not otherwise provided for.

XIX. Fixes charges for keeping public cisterns filled.

XX. The City allowed to flush streets and sewers from fire hydrants at an agreed price to be stated, provided use not beyond capacity of the works to supply.

XXI. Right reserved by the City to the undisturbed use
111 of the four inch pipe connections and attachments located at the date of the contract on certain streets, such use to be for fire purposes only—to supply cisterns and engine practice—these pipes not to be used for other water supply or street sprinkling after the completion of the water works, except with consent of Company.

XXII. Should Thomas R. White find it necessary at any time to cut off the water from any or all of the supply mains, deductions in charges for water supplied be made, both to the City and consumers so deprived of its uses or benefit equal to double what would have been due during such time, to Thomas R. White, had not such interruption in supply occurred; provided that a temporary stoppage in the supply, not exceeding twelve (12) hours' duration, at any one

time, for the purpose of repairing, extending or tapping water mains shall not be considered an interruption for rebate.

XXIII, XXIV and XXV provide for depths of pipes in ground, uniformity of hydrants and valves, use of private fire hydrants and compensation therefor.

XXVI. After fifteen years from the date of acceptance of the works by the City, under the contract, if at that time the City does not become the purchaser of the works, the annual rental on fire hydrants on all future extensions was to be reduced to one half the prices now agreed upon, the original rates to remain on the distribution existing at that date.

XXVII. Whenever the consumption of water on the line of any street main is so great as to reduce the pressure between the hours of nine (9) and ten (10) o'clock A. M. and one (1) and two (2) o'clock P. M. below thirty-two pounds to the square inch, said water mains shall be deemed of insufficient capacity and shall be
112 replaced by Thomas R. White with pipes, mains or connections of sufficient size to give the pressure above named—the level of the market house floor to be taken as the index for levels and pressures. No water main of less than four (4) inches diameter shall be used in the distribution system.

XXVIII. Thomas R. White obligates himself to extend mains whenever he shall be assured of a permanent annual income of $700 per mile of pipe, or $150 a year on a line of 1,000 feet, or $100 on a line of 600 feet. These incomes when the pipes laid may be of four (4) inches in diameter, with fifty (50) per cent. additional assurance income when six (6) inches is to be laid, either direct- or indirectly, to supply the same in length not exceeding those mentioned.

XXIX. The fire hydrants shall be located along the streets where the pipes are lain, and their location shall be with the approval of a special committee appointed by the Council.

XXX and XXXI respectively relate to subject matter of location of fire hydrants (to be done under approval of committee of Council), interferences in the construction, with gas pipes, sewers, etc., and relaying water pipes.

XXXII, XXXIII, XXXIV, XXXV and XXXVI give to White the right to occupy the streets of the City for constructing the system, having due regard for the public safety and convenience; he is to repair all damages to the streets, other than caused by negligence of City employees, and is to hold the City harmless of all damages arising in work of construction and is to restore the streets to as good condition at completion of the works as they were before work began.

113 XXXVII and XXXVIII forbid the use of public water for private purposes, and the City agrees to protect by legislation the hydrants and valves.

XXXIX. The City is to aid in procuring such additional State and municipal legislation as may be required to protect the rights and property of Thomas R. White.

XL. The proposed works shall be built in the most substantial manner and of the best materials, and on such a scale as to permit

the extension of the pipes and an enlarged supply for the public without remodeling or altering the machinery or street mains for many years to come under ordinary conditions.

XLI. Refers to supplying certified copies of the contract to White by the City.

XLII. It is provided that at the end of fifteen years from the completion of the works the City shall have the right to purchase the same with all the rights, franchises and property at a price to be mutually agreed upon, or the valuation may be ascertained by three disinterested non-residents of Columbus or Muscogee county, one to be a hydraulic engineer—the City to appoint one arbitrator, White one, and these two to select a third. When the value of the works is thus ascertained and declared, the City shall pay the sum named with ten (10) per cent. added; and the City shall, in this purchase, assume all the obligations of White, the lawful acquittances of which shall be received by White as a part of the cash payment of the declared value of the water works. The obligations include such as are for operating, maintaining and extending the same, and the duties incident thereto. In assuming money obligations for
114 indebtedness, or choses in action, due from White to others, the same shall be in lien of cash payments to equal amounts, and no obligation to assume money liabilities greater than the value to be paid by the City; but the City has the right to decline the purchase after the value is ascertained upon payment of expenses of arbitration. If the City does not buy on this valuation when ascertained the right and privileges of White shall continue in force until the final purchase of the works by the City. The right to purchase shall enure to the City every 15 years, but in every case White is to have 12 months previous notice of the City's intention to purchase.

XLIII and XLIV refer to right of White to cut off the water from consumers when the plumbing is defective, and to right of City to order the water cut off from use of private consumers when the same, in its use, is permitted to become obnoxious, stagnant, putrid or unclean.

XLV. In the execution of this contract by Thomas R. White, should the gravity system contemplated be found impracticable, either owing to natural causes, objections or unreasonable requirements of land owners regarding the right of way for the pipes leading to the City, a well constructed secondary or distributing reservoir may be used of not less than 3,000,000 gallons capacity, and two full system of pumps, operated by either water or steam power, may be used for elevating water from the storage to the distributing reservoir, such pumps to be first-class, of easy capacity, of not less than 1,500,000 gallons daily, to be capable of being worked separately or together; pumping connections between reservoirs to be twelve inches or more and proper valves and attachments used; filtering arrangements in storage reservoir, as heretofore described. The ele-
115 vation of this distributing reservoir to be not less than twenty feet above storage reservoir. Such distributing reservoir to be kept well supplied with water, in good condition in every way,

and all arrangements consequent to distributing reservoir being used and adopted shall be provided by Thomas R. White.

XLVI. White is to begin work within twenty days after City ratifies the contract and is to continue the same without interruption (except for Providential cause) with a view of a full operation of the works by May 1st, 1882. He is to procure all necessary real estate, water rights, etc., and proceed without delay to build a storage and if necessary a distributing reservoir. Within two months he is to ship the supply main, or a named number of feet thereof.

XLVII. If the work is not *bona fide*, commenced within thirty days from execution of the contract, or not completed prior to June 1st, 1882, all rights vested in White by the City under the contract shall revert to the City and all property and rights procured by him for building the works should be forfeited to the City, and all damage done by White to property, public or private, by reason of the incomplete works, shall be repaired at White's expense.

XLVIII. Should natural causes or unavailable requirements of owners of real estate required in construction render the building of a storage reservoir at an elevation above 110 feet impracticable, then, if deemed expedient, Thomas R. White may adopt what is known as the Holly system of water works in lieu of other system. In this event a storage reservoir of not less than fifty million gallons capacity shall be provided—pumps and boilers of ample capacity in
116 duplicate. Arrangements shall be made for domestic pressure, equal to not less than that due to 100 feet elevation, and a fire pressure of not less than that due to 150 feet. Direct electric communication from fire alarm station of City to pump house, with proper arrangements for early fire pressure in case of alarm. As far as this system can be made to conform with provisions hereinbefore set forth it shall be so done in the use of the Holly system.

In connection with the foregoing must be considered the terms of a supplemental agreement between the Water Company and the City made June 1st, 1898, and finally consummated May 3rd, 1900. (See Head 5 of this report under Findings of Fact.)

3.

White, together with the Water Company, his assignee, selected a source of water supply on hills in the State of Alabama four miles west of the City, constructed a reservoir and conveyed the water through a twelve-inch main into the City across one of the bridges owned by the City which spanned the Chattahoochee river; permission was given by the City to cross this bridge, and the water when so conveyed was, in the beginning, distributed through five miles of mains, as described in the original contract. The works were put in operation November 6th, 1882. The method of construction of the reservoir and distribution system will hereinafter be fully set out, together with the facts as to extensions and enlargements.

117 4.

On September 1st, 1886, a resolution of the City Council was adopted calling attention of the Water Company to the insufficient

supply of water and unwholesome quality thereof, and the requirements of Sections 10, 11 and 13 of the contract. In reply to this, the water committee of Council reported that the President of the Water Company had been notified and expressed an intention of correcting the evils complained of.

On April 6th, 1887, the Committee on Fire Department and Water Works reported to Council (Vol. 1, page 38) that under a test made by the Superintendent of the Water Company and the committee the water pressure on the street mains was lower than the minimum fixed by the contract. Council withheld the water rentals.

On January 12th, 1888, the Water Company promised Council that it would take immediate steps to restore the pressure on the mains to the required pressure.

On April 4th, 1888, the Water Company petitioned Council to rescind a resolution which had been adopted April 6th, 1887, requiring the Company to remove their pipes from the upper bridge; also to be permitted to erect a standpipe before September 1st following, to be of 120 feet elevation and proper proportion at its base. Council rescinded the resolution and granted permission to erect a standpipe, the Company having stated that its object in erecting a standpipe was to add to the pressure on the mains and have an additional water supply in case of casualty.

On June 5th, 1888, the record shows that differences with the Water Company had been arranged and all water rentals
118 which had been withheld were ordered paid.

On July 16th, 1889, Council records show that there had been marked improvements in the water service. (Vol. 1, pages 305-308.)

I find that the system as accepted by the City in 1882 had not met the general requirements of the contract, and that on complaints to the Company the system had been improved to such an extent that in 1889 the service at that time was accepted as satisfactory to the City.

5.

In 1886 the City was enlarged by the annexation of a square mile of territory north and east of the old city and designated as the Annex, the elevation of which was considerably above the level of the old city. The Annex was composed of residence sections known as Rose Hill and East Highlands. This territory all lay north of Seventeenth Street, except a small portion in the southeast part. Annexation of the above territory presented a question evidently not in contemplation of the parties in 1882, but nothing is shown by the evidence that any steps were taken by either party to the contract to supply water to the new territory at the time of annexation. In 1891 the Chief of the Fire Department of the City reported that the Water Company had extended its mains on Third Avenue to Twentieth Street, which is north of Seventeenth Street, and from experiments made, water to the height of 20 feet had been obtained. He recommended that fire hydrants be placed at certain specified localities in this new territory. (Vol. 1, p. 298.) On March 1st, 1893, the City Council by unanimous vote appointed a joint committee of

citizens and from Council to make investigation and report
119 on the necessities of the City for water supply, method of supply, cost thereof, and means for raising funds for the purpose.

On April 5th, 1893, the City, by resolution, submitted to the Water Company the question as to whether the present Company could supply water to the annex and such other portions of the City as were without water; and whether and upon same terms to the annex as the present contract, and if not, upon what terms and in what time. To this the Company replied April 13th, 1893, that it had two reservoirs with a joint capacity of 145,000,000 gallons, and the upper reservoir with an elevation of 146 feet above the level of the old city, and that it had purchased ground for an additional reservoir of 400,000,000 gallons and additional springs of supply, and could supply all water needed; that it could supply this in accordance with the terms of its contract with the City; that it could give sufficient quantity and pressure to cause the water to flow freely into fire engines and such domestic pressure as to furnish houses, and would build another standpipe if necessary, and that the time required would depend upon the amount of work to be done. This matter was again referred to the joint committee of Aldermen and citizens.

On November 9th, 1893, the joint committee of Council to whom was referred the resolutions of March 1st and April 5th, 1893, reported in substance—that over one-half of the area of the City was without a water supply except from wells; that the annex was without water under pressure; that the pressure from the present works supplying the old City was too low, the maximum being 45 pounds; that municipal ownership was desirable; that the City should
120 issue bonds and build its own works; and that a new system be adopted. With this report was an elaborate report of an expert hydraulic engineer giving full details of the present and proposed system. (Vol. 1, page 490.) The general tenor of this report condemned the then existing works as inadequate and inefficient. It will be referred to again hereafter.

On April 30th, 1894, the Water Company, in reply to a committee from Council requesting the present Company to say if it could furnish water to the annex, stated that it would build a standpipe in the annex and extend main thereto if the City would order same and agree to pay $75.00 for each annual rental for 18 hydrants. This communication stated that the Company could not guarantee any specific pressure for these new hydrants, but there would be sufficient pressure to feed fire engines and cause water to flow in the second story of houses. This reply was laid before Council. No action was taken thereon, but Council on May 2nd, 1894 (Vol. 1, page 198), again appointed a joint committee of citizens and Aldermen to confer with the Water Company and call its attention to the report of November 9th, 1893, and that of the hydraulic expert, and ascertain if the Company would make proposed changes or enter into a new contract, and if not, on what terms it would sell its present system to the City. It was resolved that if no satisfactory agreement could be

reached with the old Company, Council would take steps to erect a new system.

On September 10th, 1894, the joint committee last above referred to reported, laying before Council a volume of correspondence which had been had between the committee and the Water Com-
121 pany, the substance of which was on the part of the City a demand for water in the annex, and upon what terms and conditions would the Water Company supply same, and on the part of the Company that it had found it difficult to get its Board of Directors together, but the President of the Company replying, refers to his previous communication of April 30th, 1894, and furthermore states that if the City consents to a new contract and would relieve the Company of unreasonable complaints of defects not admitted as existing, the Company would make a new storage reservoir and give a pressure of 90 pounds, and thereby giving a pressure of 40 pounds in the annex; would also agree to take up all 4 inch mains, and replace with 6 inch mains if Council would guarantee the additional income as by contract. He also stated that the Company would consent to a new contract as to modification of charges. This correspondence covers dates from May 7th to August 16th, 1894. (Vol. 1, pages 400 to 417.) The report was received, but an ordinance was introduced, and at the next meeting of the Council adopted, providing for an election and bond issue with which to construct a new system of water works. The ordinance repudiated the contract of October 7th, 1881, and declared that if the Water Company desired to furnish the City of Columbus with water it must make a new contract with the City. The basis of the ordinance as recited in the preamble was that the existent contract when made had not been submitted to a vote of the qualified voters of the City. With reference to the proposition to sell, the President replied that he would call the Directors of the Company together and submit the
122 matter. It does not appear that this was ever done.

On October 3rd, 1894, Council adopted a resolution confirming its former action in repudiating the contract and setting out further reasons for having done so; especially in that the Water Company had failed to propose to remedy defects in the system; further that the present system was inadequate in quantity and pressure for present and prospective needs of the City; further that it was impracticable for the annex to be supplied from the present system, and that the Company had violated the contract of 1881 in not complying with Sections 3, 10, 11 and 12 and in other respects.

On November 26th, 1894, the Water Company by letter of date of November 10th, through its Secretary and under order of its Board of Directors, proposed to adjust all differences between the City and Company and provide for future demands; an offer was made to furnish all water and pressure needed by the City both in the old and new portions thereof. The Company proposed to arbitrate all differences, the judgment of the arbitrators not to be appealed from, and it was proposed by this arbitration to include the final settlement of the question of pressure, amount of water, price to City and consumers and extension of the system into the annex.

Council rejected the proposition on the ground that an ordinance had been passed providing for an election; that there was nothing to arbitrate and that all such contracts for more than one year should, under the law, be submitted to popular vote.

On December 10th, 1894, the election on the ordinance to
123 issue bonds resulted in a vote of 1110 in favor and 765 against the issue; the measure being lost for want of the requisite two-thirds majority.

On December 23rd, 1894, Council adopted a resolution expressing what it believed to be its needs as to water, which fully stated were: A reservoir of five hundred million gallon capacity; a conduit pipe of 24 inches diameter; a minimum pressure on level of old city of 75 pounds and an annex of 45 pounds; proper filtration; distributing pipes of not less than 8 inches and abolishment of dead ends; a daily supply of 4 million gallons; the regulation of the use of water by police authority and not by meters; that the price of water was too high and the amount per capita too low; certain stipulated prices were named and that not recognizing the present contract as of force after January 1st, 1895, the Water Company was requested to say whether it desired to furnish water to the City on the terms as above set out. To this the Company on January 2nd, 1895, replied that it would not admit it had no contract with the City, and that on points complained of Council should have given the Company a hearing. It expressed a willingness to accept any reasonable modification of the contract that would bring the City to a better understanding; that the pressure could be obtained through pumps, either by erection of a standpipe at the highest point in the annex or by reservoir; it stated that 4 inch distributing pipes were too small and the present owners had not installed less than 6 inch pipe; it proposed to put itself in position to give the City a potential supply of four million gallons daily either by pump or a new reservoir; it admitted the City needed more water and proposed to extend the system both in
124 the old city and in the annex on the same terms the old city was to be supplied; it proposed to add to the fire hydrants in lines already in for an agreed price and to charge $40.00 per hydrant annual rental on all extensions; to increase the amount of water per capita and to revise, after conference with the City authorities, the water rates, and to furnish, if desired, a pressure of 75 pounds at the market house and 45 pounds in the annex for fire protection. It does not appear that any action was taken on this proposition.

On November 27th, 1895, Council adopted a resolution directing its City Engineer to make estimate of the water in the reservoirs and report their condition. A committee was appointed to assist him.

On December 4th, 1895, Council adopted a resolution to notify the Water Company that after 1895 a new agreement as to water would have to be made. At this meeting the special committee appointed to ascertain with the City Engineer the conditions of the water supply reported the Engineer's findings—to the effect that the upper reservoir contained no available water, and that the lower reservoir, with a capacity of 13,287,435 gallons, then had a fraction over 7,000,000 gallons. (Vol. 1, page 435.)

On January 1st, 1895, Council appointed a committee to confer with the Water Company and report what agreement could be made as to a water supply, price, length of contract, etc.

On April 1st, 1896 (Vol. 1, page 439), was submitted correspondence from the Water Company to Council (covering dates from March 4th to March 23rd, 1896) proposing to extend system to annex, erect standpipe, therein provided City would pay rentals
125 on hydrants as in old City; also connect up dead ends, thereafter lay only 6-inch mains, remove all fire hydrants from 4-inch mains, properly reconstruct upper reservoir, and take in new spring for water supply, and begin and complete work as early as practicable; the proposed changes would give 60 pounds pressure generally and no less than 30 pounds in the annex; that if this proposition was not accepted the Company was ready to carry out any former propositions made, provided the City, by such acceptance, would consider same a final settlement of the water supply for the City, and the present contract in force till its expiration. (Vol. 1, page 443.)

It appears (Vol. 1, page 444), that this proposition was acceptable to the City except the last clause as to recognizing the existing contract. In reply to this the Company stated that unless the City would give some assurance of permanency to the agreement the Company could not dispose of its securities reserved for purposes of extension. It does not appear that any conclusions were reached.

In February, 1897, the City ordered, and there was held, another election by the people on an ordinance proposing the issuance of bonds by the people for erection of water works, the proposed issue again failing because of the requisite two-thirds majority.

On June 1st, 1898, a committee of Council appointed at the preceding April meeting to obtain from the Water Company acceptance of a proposition to extend the system to those parts of the City not then provided with water, reported a formal proposition from the Water Company, and the same was unanimously accepted on recommendation of the committee.

126 On April 4th, 1900, the Company notified Council that it had complied with the proposition. A special committee of Council reported that the work had been examined and test of pressure made and found satisfactory, but that all the conditions had not been fully complied with. The omissions were specified and a special committee appointed to confer with the Company.

On May 3rd, 1900, the special committee reported, and again on June 6th, 1900, after further investigation made report, Council adopting same. This proposition finally accepted as between the City and Water Company is set out in substance as follows: (Vol. 1, pages 316-328.)

1. Lay off the City into two water districts, known as upper (or Rose Hill) District and Down Town Districts, with Fourteenth Street as dividing line.

2. Supply upper district from Rose Hill standpipe and lower with Broad Street standpipe, the two districts to be connected with proper

valves at No. 1 Engine House so as to connect or disconnect the two systems as occasion required, the valves to be in control of City.

3. The base of Rose Hill standpipe to be 90 feet above level of market house, and pipe to be 120 feet high, making total of 210 feet elevation.

4. A pump to be installed with capacity to fill Rose Hill standpipe and keep it filled; a *guage* to be placed at standpipe under City's control. In emergency pumping is to be directly in the mains.

5. The City to pay for this additional service $2,000 per annum, the Company to supply 50 additional hydrants in old or new part of City as City designates, and these to be exclusive of 100
127 hydrants to be furnished in old city, making total of 250 fire hydrants.

6. No pipe less than six inches diameter to be laid and two six inch mains to connect the main from Seventeenth Street with Rose Hill standpipe.

7. Payment by City to begin from April 4th, 1900.

8. Test of pressure as detailed to be made, the pressure to show not less than 40 pounds through two lines attached to double hydrants.

On July 16th, 1902, the City requested the Board of Health to have an analysis made of the water of the Water Company. The Mayor submitted a message in substance that the present water system is unprepared to furnish a constant and sufficient supply of wholesome water to the City; that in view of failure of proper service by the Water Company, the City had withheld payment of water rentals due July 1st, 1902, pending an investigation as to legal rights of the City, and until adjustment could be made and an agreement be obtained from the Company to lay larger conduits from the reservoir, and larger mains in the City where needed, construct a proper filter plant and make such other additions necessary to furnish proper service for which the Company has been demanding and receiving payment. Council then adopted a resolution to the effect that it was the sense of Council that the City should construct and own its own system, and an ordinance for a bond issue was on September 14th, 1902, authorized, (Vol. 1, page 445.) Subsequently Council adopted an ordinance providing for the bond issue as set out in the Bill of complaint, the same having been ratified by a popular vote Decem-
ber 4th, 1902, in which the vote was 1640 for and 7 against
128 the bond issue. These bonds were validated as provided by law and were being advertised for sale by the City when the Bill in this cause was filed. Council in 1902 procured the passage of an Act of the General Assembly (Acts 1902, page 370) authorizing the City to construct and own and operate its own water works system and establish a Board of Water Commissioners for that purpose; said Board was subsequently established. The recitals in the preamble of the ordinance of September, 1902 stated that the Water Company had totally failed to supply the City with a sufficient quantity of pure and wholesome water and that the public health was paramount and public ownership would conduce to great saving in cost of water to the City.

I find that from 1889 to May, 1900, except at comparatively short intervals, there was dissatisfaction and complaints on the part of the City because of insufficiency of the water supply, and especially with the unsupplied needs of the City for water in its annexed territory; that the Company had notice of this and recognized the necessity of increased supply. I further find that during this period the differences between the Company and the City led to an effort by the Council on two separate occasions to repudiate the contract, but that it was not sustained by the requisite popular vote, thereby indicating the desire of the people to give to the Company an opportunity to carry out the terms of the contract; that the Company in apparent good faith endeavored to adjust the differences by offer to arbitrate and the Council declined, and that finally the Council accepted existing conditions and concluded a supplemental agreement by
129 which the Company was given an opportunity to test its ability to fully meet the requirements of the contract; and that in 1902 both the Council and the people determined to no longer depend upon the Water Company.

6.

Under Paragraph X of the contract the original contractors selected as a source of water supply a point four miles west of Columbus, in Alabama, and thereon constructed what is designated the lower reservoir. This reservoir covers an area of 3.85 acres; has an average depth of 9.5 feet, and a storage capacity of 12,078,000 gallons. It has a rock bottom, marginal depths of 4 feet properly walled, and is free from trees, stumps, roots, grass and alluvial deposits and vegetable and unwholesome matter. The water originally flowed directly into this reservoir from what was known as Holland creek, entering from the north, being an ordinarily clear water stream except in stormy weather. The water is drawn from this reservoir by a cast-iron conduit of internal diameter of 12 inches, being held in reserve by a stone dam 20 feet high. In the bottom of the reservoir underground springs supplemented the supply from the creek. The elevation of this reservoir at top of dam is 117 feet above the floor of the City Market.

In 1885 the Company constructed a second or Upper Reservoir immediately north of the Lower Reservoir, separating the two by a stone dam partially across the south end of the Upper Reservoir. The remaining support is a dirt embankment. This was intended for a storage or settling reservoir into which the water flowed from the two prongs of the creek known as the East and West
130 prongs; from there it was allowed to flow directly over the top of the dam into the lower reservoir. In 1889 a by-pass was constructed on the west side of the two reservoirs by which storm water was conducted around and below the lower dam. This upper reservoir originally covered an area of 17.1 acres and had a capacity of 39,392,000 gallons, with the exception of the south end, which is partially occupied by the stone dam, the excavations and embankments were not made about the margins so as to avoid thin edges and provide a marginal depth of four (4) feet. This reservoir

has not been kept free from grass, weeds and alluvial deposits, but from the first has been allowed to become in a great measure filled and remain with such deposits, and no proper and reasonable methods for cleanliness and purity have been maintained. As long as the supply streams are in normal condition and the reservoirs are kept full, or reasonably so, clear and comparatively pure water can be obtained. With the construction of the by-pass an arrangement was made to draw all water from the upper reservoir from or near the top of the surface through a main extending around the west end of the dam and into the lower reservoir. This is controlled by gates to shut off the water when unfit for flow into the lower reservoir. This arrangement is of no avail when the water is low. A 12 inch main extends from the upper reservoir directly into the supply conduit below the lower reservoir to be used in emergency to increase the water supplied to the main conduit. It is controlled by a check valve. When the streams become abnormally low the lower and the upper reservoirs are not properly supplied, and the water be-
131 coming stagnant it is impure and the source of supply greatly limited. These conditions existed to a marked extent in 1894 and 1895, and again in 1898 and 1899, and notably so in 1902. In the last named year the supply failed entirely in both upper and lower reservoirs. This occurred again in 1904 pending the operation of the works by the Receiver, and in 1903 he was frequently compelled to supplement the reservoir supply with river water. On the occasions of entire failure resort was had to water from the Chattahoochee River as the only source of supply. The total capacity of the reservoirs (which should be treated as one) was in 1890 estimated by a competent hydraulic engineer to be twelve million gallons for the lower and forty million for the upper reservoir, making total of fifty two million gallons. In 1893 the capacity of the two was ascertained by actual measurement to be 51,470,000 gallons, and at the time of the taking of testimony in this hearing the capacity was estimated at fifty-one million. The upper reservoir has sloping sides to the west and east and is open at the north. The alluvial deposits from the two inflowing streams have practically lowered the depth and forced the water to rise on the sides into shallow depths and thin edges. When the water fails, as in the years before named and at all times of prolonged drought, which is not infrequent in this section, the bottom of the reservoir exposes to the action of the sun and air considerable areas of mud impregnated with decaying vegetable matter. Photographs of the two reservoirs are in evidence and also a diagram. (Vol. 1, 310, 312, also page 490. Hall report plate II.)

I find that the water Company has at no time complied with Section III requiring a reservoir of 125 million gallons avail-
132 able capacity, and from 1884 it has failed to comply with the requirements of Section XII as to the construction and maintenance of the reservoirs.

7.

At the south end of the lower reservoir, at the point of intake of water for the supply main, is located a contrivance which acts as a

ment account the Company accounts for 60 bonds. These added to the 8 bonds in hands of the Receiver accounts for only 68 bonds, leaving 7 bonds unaccounted for. I assume they properly went to the Company, making it accountable for 75 bonds, and of these, the proceeds of 67 have been utilized for the Company's benefit, and 8 are held by the Receiver. These 67 extension bonds were all sold through Wilson Colston Company and were purchased by parties already holding the bonds of the Company at time of the sale.

I find that there are 392 bonds outstanding, of which 386 are on deposit with the bondholders committee. I further find that the 67 extension bonds should be placed on the same basis as the 325 bonds originally issued, and that at the time of the filing of the Bill the Company should be chargeable with interest on these 392 bonds.

163 15.

The receipts of the Company from January 1st, 1891, to July 1st, 1902, are not shown. A statement submitted (Vol. 1, page 361) showed an expenditure for betterments during this period of $92,749.00. Items to the amount of $15,233.90 should be deducted from this as not properly chargeable to betterments. This last amount is made up of purchase of lands and maps and surveys in 1892 and 1893 for a contemplated additional reservoir, which was not constructed, and for discounts on bonds delivered to and sold by the Company.

The amount properly chargeable to betterments is.....	$77,515 10
Of this amount there was expended:	
For Rose Hill standpipe.....	5,797 44
Meters and meter boxes.....	7,084 08
Submerged main.....	6,881 65
Other mains (most of which were placed in annex)....	41,123 21
Total.....	$60,886 38

The statement shows that during the above period the Company received and sold the following extension and improvement bonds at the discounts stated:

1892 Aug. 3rd.....	$15,000.....	Discount 7½	per cent.
1893, July 28th.....	6,000.....	Discount 20	"
1893, Aug. 10th.....	1,000.....	Discount 17½	"
1893, Aug. 17th.....	2,000.....	Discount 15	"
1894, March 7th.....	7,000.....	Discount 7½	"
1896, Jan. 1st.....	5,000.....	Discount 15	"
1897, Jan. 1st.....	7,000.....	Discount 10	"
1900, Feb. 2nd.....	2,000.....	Discount 10	"
1900, April 8th.....	15,000.....	Discount 12½	"
	$60,000		

The net proceeds of the above 60 bonds was $53,150.00, to which should be added the par value of 7 other bonds not appearing
164 as discounted, making a total of $60,150.00, which deducted from the total of $77,515.10 left $17,365.10, as representing the amount available for betterments and extensions from 1891 to 1902, inclusive, from the net earnings of the Company after paying all fixed charges of taxes, insurance and interest and operating expenses. This would be an average per annum of only $1,500.00. All the proceeds of extension bonds and all surplus net earnings over fixed charges and operating expenses were expended on betterments. Comparatively few expenditures were made for betterments prior to the extension into the annex. The project of an additional reservoir contemplated in 1892 and 1893 was abandoned as impracticable. Prior to the supplemental contract of 1898, some additional mains were placed in the annex, and some in the lower town district. The proceeds of the extension bonds were used in carrying out the supplemental contract and perfecting, as far as possible, the annex extension. The operating expenses materially increased after the annex extension. The evidence fails to disclose what was the surplus income of the Company available for betterments for the consecutive years from 1891. The surplus, as previously stated, was represented for the year 1890 to be $8,000, with an interest account at six per cent. on $325,000. In 1899 the statement of surplus was $6,073.47, with 370 bonds outstanding at five per cent. In 1900 the surplus was $3,879.57, with 386 bonds outstanding at five per cent. Had these bonds carried six per cent. there would have been no surplus for this year.

The growth of the City since 1900 has been very marked
165 both in increase in population and number of buildings, and there has been increased demand for use of water for all purposes. On February 14th, 1902, Mr. Colston and others as a committee representing the bondholders, proposed to the City to waive the time provisions of the contract as expressed in Section 42 as to purchase and to sell the system to the City on a value to be ascertained as the contract provided, the offer to be open till March 10th thereafter, and if not accepted the bondholders proposed to enlarge and otherwise improve the system. (Vol. 1, page 378.) On the failure of the reservoirs in 1902 the Company contemplated changing the source of supply and improving the system, and of its own motion resorted to the river as a source of supply. Pending negotiations between the bondholders and the Company as to what should be done to remedy the situation and improve the system the City ordered and held its bond election and also withheld its water rentals. These were shortly afterwards paid. After July, 1902, the rentals for July, August and September were withheld and have not been paid. In December, 1902, the Company admitted the necessity of foreclosure, and that it had not maintained and improved the system as the growth of the City demanded. The reason for this, as stated by the President of the Company, was want of funds, the attitude of the City towards the Water Company and other causes. The system

needed reinforcement and strengthening in 1892, and again in 1902. Every system should be thus treated every ten years.

I find that the Company has not been able, for the want of available funds, to maintain and improve its system as the growth
166 of the City demanded, and that extensions since 1891 have, from time to time, been, with the exception of a small amount, paid for by a necessary increase of a bonded indebtedness originally out of proportion to the earning capacity of the system and constantly growing further beyond the ability of the system to maintain. I further find that the system has not been reinforced and strengthened as its needs required, and that the owners of the bonds recognized this fact.

16.

The Receiver assumed charge January 13th, 1903. Under permission of the Court he immediately began improvement of the system and to January, 1904, he had expended as follows: (Vol. 1, page 366.)

New service pipes, meters, hydrants and valves	$2,225 97
Filter plant and pumping station	33,903 28
Land purchased	6,411 75
New mains	2,648 57
New machinery	73 12
Engineers' salaries	1,958 16
Total	$47,220 85

The filter plant is of the latest and best pattern and has a capacity of two million gallons daily. The largest amount taken by the City in any one day from the Receiver was 1,169,000 gallons. He has practically doubled the efficiency of the system, and has been able to supply the City with ample fire protection, but not at all times with water suitable for domestic uses. His source of water supply has been the river, supplemented, when the supply would admit of it, with water from the reservoirs. The supply from the
167 reservoirs being at times uncertain and insufficient the filter plant and pumping station established by the Receiver can practically be considered as adapted only to the use of water from the river as a source of supply. The plant at present can deliver daily from the river 1,600,000 gallons. The reservoirs are not to be relied on. Of the item of land purchased in the above statement $5,000 was for seven acres of land located on the river north of the City and above Bibb Mill dam. Included in the betterments are pumps of adequate capacity to operate the filter plant. These pumps and filter plant could be made available for use of river water or water other than the river if a suitable source of supply was obtained and it was found necessary to use pumps and filtration.

I find that the actual amount expended by the Receiver to January, 1904, in betterments is $42,220.85.

17.

The complainant in behalf of the bondholders submitted evidence through an expert hydraulic engineer as to what improvements were requisite and necessary to place the system within the requirements of the contract and conform to the needs of the City.

The City needs a supply of three and half million gallons water daily. The river is the only practical source of supply under present system. The system should be reinforced by larger mains. The present reservoir supply could be used when available, but the uncertainty of the streams in dry weather renders this source unreliable. Changes suggested are to—

Run 20 or 24-inch mains from the land purchased by the Receiver above Bibb Mill dam and deliver water from the river
168 to present pumping station foot of Seventeenth street. Supplement this with reservoir supply when available.

Substitute a 16-inch main for the two 6-inch mains from pumping station to Rose Hill standpipe, thereby making the friction 27 times less than it now is on this line.

Lay a 16-inch main from intersection of Seventeenth street and Third avenue down said avenue to Ninth street, and continue it as a 12-inch main to Sixth street. This would reduce friction loss at Third avenue and Ninth street from 52 pounds now existing to 13 pounds.

Place cross mains on all streets where there are now no mains, so as to tie the Third avenue main, which is about the center, with the entire system.

Tie up all dead ends and discard very nearly all 4-inch pipe, substituting 6-inch mains, which should be tied in from Broad street to Fifth avenue along Fourth and Fifth streets.

Place 6-inch mains on Eighth street from Front street to Fourth avenue.

Place 12-inch mains on Ninth street from Front street to Sixth avenue.

Place 8-inch mains on Eighth street from Broad street to Sixth avenue.

Extend the present 12-inch main on Fourteenth street east to Sixth avenue.

Extend the present 6-inch main on Fifteenth street east to Ninth avenue, and up that avenue to Cemetery street, and out that street to Tenth avenue, and up Tenth avenue to Seventeenth street, and then connect with 6-inch mains on Seventeenth street, thereby making a circuit for that part of City.

169 Place 6-inch main on Ninth avenue from Seventh to Twelfth street connecting all dead ends on the avenues.

Place proper valves to regulate the various districts so as not to cut off water from the whole system when repairs *were* needed.

Tie in the 6-inch mains on East Highlands with the improved system.

These changes would enable present system to deliver more water and at higher pressure and at any point in the City for next

twelve years and permit of extension of new districts as City *grew*.

The estimated cost of above improvements is $50,000. This amount is independent of cost of the 24-inch main proposed to be run from the pumping station up the river. This last is estimated to cost $35,000 as maximum. The total estimated cost is $85,000, exclusive of expenditures already made by the Receiver.

I find that the probable cost of such improvements as are needed to make the system adequate for the present needs of the City will be $85,000, exclusive of expenditures made by the Receiver, and that such improvements and changes contemplate the river as a permanent source of supply.

18.

To ascertain the value of a water works system there must be considered the elements of quality of material, cost of installation, and estimates of value as a going concern or its good will. Section XLII of the contract provided for ten per cent. to be added to the ascertained value of the property, which I assume is the esti-
170 mated value of the good will. The system could have been duplicated in—

November, 1893 (Hall's report, page 40) for.....		$119,000 00
The reservoirs were valued at..	$18,000 00	
The 4 miles of supply main (21,120 ft.) at $1.05 ft. laid..	22,176 00	
The betterment account (Vol. 1, page 366) shows cost of Stewart Spring property and McElvey land not utilized.....	7,189 00	
Ditto submerged mains.....	6,712 75	
	$54,077 75 deduct	54,077 75
Leaving value of system within City at close 1893....		64,922 25
Betterments added since January 1st, 1894, to date Receivership		62,260 38
		$127,182 63
Deduct value of 24,700 ft. 4-inch pipe, costing 36 cents per foot laid.....		8,892 00
		$118,290 63
Add betterments made by Receiver, not including 7 acres land not utilized by him.....		42,220 85
		$160,511 48
Add 10 per cent. for value good will—that is, the connections with and supply of buildings.....		16,051 14
Total present value of plant as going concern..		$176,562 62

I have deducted the value of the 4-inch pipe because it is worthless for distribution purposes, except to be taken up and relaid for service extensions. The Company laid no 4-inch pipe after 1895. I have also eliminated the Alabama property as of no value to present system because unreliable, and the submerged main
171 because it failed at the first test, and I have made no deduction for depreciation, as the piping is practically as good as when laid, and the standpipes, valves and pumps and property other than the piping I have also considered without any deduction for depreciation, as there was no evidence disclosing depreciation, and the Receiver was giving efficient service through the system with the river as his source of supply, showing the efficiency of the distribution system under the improvements which he had made when considered as to the sole question of the capacity of the system for delivering water. The above total valuation is for only such parts of the system as are available and capable of use for future operation of water works. They, however, must be considered in connection with the river as a source of supply, as they are now so operated. The evidence with relation to values of the system as it stood at the conclusion of the hearing was by no means satisfactory, but with such as was submitted I find the present estimated value of the available portion of the system, with the river as a source of supply, to be $176,562.62.

19.

I find that the annual rentals which the City was paying to the Water Company at the date of the filing of the Bill was $10,260.94 and that during the period of service the City had been paying its annual hydrant and other water rentals in quarterly payments; that prior to 1902 these quarterly payments had been on two occasions withheld until the Company, after protest by the City, somewhat improved its service; that the quarterly payment due July 1st, 1902, was withheld because the Company failed to keep its Rose Hill standpipe properly filled to supply proper pressure; that this was
172 subsequently paid; that the quarterly payment due October 1st, 1902, was withheld and never paid, and that the amount thereof is $2530.82, being for service claimed to have been rendered under the contract for the months of July, August and September, 1902; that this amount was withheld by the City because the water furnished was from the Chattahoochee River and not from the source of supply originally selected, and I further find that since October 1st, 1902, the City has paid to the Company and subsequently to the receiver the rentals as they fell due. I find that for the quarter ending October 1st, 1902, the City received the benefit of the water furnished during that period, but for fire protection only. The water furnished was unfit for any other purpose.

173 *Summary of Findings of Fact.*

1. I have found that acceptance by the City was based on statement of the Water Company that the system had been completed in compliance with the contract and upon assurances by the Company that the water would be wholesome, abundant and lasting.

2. The contract outlined.

3. Selection of source of supply and completion of the works November 6th, 1882.

4. I have found that the system as accepted by the City in 1882 had not met the general requirements of the contract, and that on complaints to the Company the system had been improved to such an extent that in 1889 the service was at that time accepted as satisfactory to the City.

5. That from 1889 to May, 1900, there was dissatisfaction and complaints on the part of the City because of insufficiency of the water supply, and especially with the unsupplied needs of the City for water in its newly acquired territory; that the Company had notice of this and recognized the necessity of increased water supply; that during this period the City through its Council twice made an effort to repudiate the contract, but were not sustained by the requisite popular vote on submission of the question to the people; that the Company in good faith endeavored to adjust the differences by offer to arbitrate and the City declined the offer; and that finally the City accepted the existing conditions and concluded a supplemental agreement by which the Company was given an op-
174 portunity to test its ability to carry out the requirements of the contract; that the Company failed in this, and that in 1902 both the Council and the people determined to no longer depend upon the Water Company.

6. That the Water Company has at no time complied with Section III, requiring a reservoir of 125 million gallons available supply, and from 1884 it has failed to comply with the requirements of Section XII as to the construction and maintenance of the reservoirs.

7. That Paragraph XI as to filtration has not been complied with on the part of the Company.

8. That the Company has failed to comply with Section V of the contract as to distribution in not connecting together the ends of its system and placing mains sufficiently large to at all times give full supply of water.

9. With reference to the supply of water, I have found that the Company has failed to comply with Sections I and X in that sufficient supply of wholesome, constant and ample water has not, and cannot be furnished from the source of supply as selected, nor is the same sufficient to meet the wants of the City and private consumers for present and future requirements.

10. I have found that the Company has not complied with Section IV as to supply main.

11. That as to pressure from 1893 to 1902, the pressure was vari-

able and uncertain; that the gravity plan could not sustain it to the requirements of the contract, and that the standpipe and pumping devices adoped to assist it, while practically beneficial, were not at all times satisfactory; that the Company has not met the requirements of Section XXVII in maintaining pressure at 32
175 pounds, nor supplemental contract requirement of 40 pounds, and that in fires of any magnitude the pressure and water supply is insufficient, and that the supply is not ample for fire protection as required by Section IX, and that the Receiver by the improvement of the pumping station has greatly bettered conditions.

12. With reference to the wholesomeness of the water as required by Section X, I have found that the reservoir water when available is, under normal conditions, a wholesome water, but when the water is low it is not wholesome; that prior to July, 1902, the water furnished by the Company was, with few exceptions, within the requirements of the contract, and in these exceptions the City has not availed itself of the provisions of Section XIII of the contract to correct impurities; that since July, 1902, the Company has not furnished a constant supply of wholesome water, nor has the Receiver been able to do so; that the Chattahoochee River cannot be relied on as a constant source of supply for wholesome water, but only so when on a normal flow of the river, water is taken from points above all possibility of contamination and properly filtered.

13. I have found that the purchasers of the Water Company in 1890 acquired the stock of the Company without consideration; that the property was acquired by the issue of half million dollars of bonds to the purchasers. Three Hundred and Twenty Five Thousand ($325,000) Dollars of which was the agreed valuation of the property, and was used by themselves in its purchase; that the price was largely in excess of its actual value and that the syndicate who originally purchased these $325,000 of bonds knew or had full opportunity of knowing this fact; that of the cash proceeds of
176 the sale of these $325,000, being the full amount, less ten per cent. discount and added interest, the sum of $150,000 was applied to discharge an outstanding bond issue, and the purchasing Company and its individual shareholders received the benefit of the remainder; that the subsequent purchasers, and who are still the present holders of these $325,000 bonds, bought the same from and upon representation of the bond syndicate.

14. That there are outstanding 392 bonds, of which 386 are on deposit with the bondholders' committee; that the 67 extension bonds should be placed on the same basis as the 325 bonds originally issued, and that at the time of the filing of the Bill the Company should be chargeable with interest on 392 bonds.

15. That the Company has not been able, for the want of available funds, to maintain and improve its system as the growth of the City demanded, and that extensions since 1891 have, from time to time, been, with the exception of a small amount, paid for by a necessary increase of a bonded indebtedness originally out of proportion to the earning capacity of the system, and constantly growing further beyond the ability of the system to maintain; that the system has not

been reinforced and strengthened as its needs require, and that the owners of the bonds of the Company recognized this fact.

16. That the actual amount expended by the Receiver to January, 1904, on betterments is $42,220.85.

17. That the probable cost of proposed improvements, needed to make the system adequate for the present needs of the City, will be $85,000, exclusive of expenditures made by the Receiver, and
177 that such improvements and changes contemplate the river as a permanent source of supply.

18. That the present estimated value of the available portion of the system with the river as a source of supply is $176,562.62.

19. That all rentals due by the City have been paid except for the months of July, August and September, 1902, which amount to $2,530.82, and which was withheld because the Company was furnishing water from the Chattahoochee River and not from the original source of supply.

178 *Conclusions of Law and Fact.*

The Bill in this cause is a proceedings by the complainant Trustee for the bondholders, and seeks to restrain an alleged threatened injury to the property securing payment of the bonds, upon the theory that the construction of a new system of water works by the City of Columbus would impair the obligation of its contract with the Water Company, and would constitute a taking of its property without due process of law. The cross-bill seeks affirmative relief. The main issue in law is the right of the City, under the facts, to withdraw from the contract and take steps to erect its own system of water works. A number of incidental questions grow out of the main issue, chief among which is the validity of the contract between the City and the Water Company and the effect upon the right of the bondholders of any failure of either party in performance of the several mutual obligations existing under the contract. The judgment of the Court overruling the demurrers has determined that this Court has jurisdiction; that the parties are properly before the Court, and that there is equity in the Bill. It will therefore be necessary only to consider such other questions made in the demurrers as may again be set up in the answer and controlled by the facts educed by the evidence.

I.

The first question to dispose of is the power of the City to make the contract.

The charter of the City of Columbus (Acts 1835, page 59)
179 provides that the City, through its Mayor and Board of Aldermen, shall have special powers in its corporate capacity to make all contracts which they may deem necessary for the welfare of the City. Counsel for defendant concede that under the "general welfare clause" of the above provision the City had the power to enter into a contract for a water supply for its inhabitants for domestic use and to provide the City with fire protection. Moreover it

is the settled law of Georgia that the power rests in the City, provided that in its exercise the City enters into no agreement conflicting with the laws of either the State or the United States. Rome *vs.* Cabot 28 Ga., 50; Wells *vs.* Atlanta, 43 Ga., 67; City of Dawson *vs.* Dawson Water Works Co., 106 Ga., 596, and Columbia Ave., etc., Trust Company *vs.* City of Dawson, 130 Fed., 152; Grace *vs.* Hawkinsville, 101 Ga., 553, 28 S. E. 1021; Webb City Water Company *vs.* Webb City, 78 Mo., App. 422.

I therefore conclude that the City had the power to enter into the contract which is the subject matter of the present litigation, provided it be found that in so doing it violated no provision of either the State or Federal Constitution. Whether or not this has been done will hereafter be considered.

II.

It is contended that this contract is void because the City, in the exercise of its corporate power, in the execution thereof, violated Article 7, Section 7 of the Constitution of Georgia (1877) which forbids the creation of a new debt without the assent of two-
180 thirds of the qualified voters of municipal corporations, this contract not having been submitted for ratification.

Section XV of the contract obligates the City to the payment of annual rentals, the contractual period being for thirty years. Is this provision in contravention of the constitutional inhibition referred to? This question has been fully settled, not only in the City of Dawson case above cited, but also in the decision of his Honor, Judge Newman, in the instant case, in disposing of the application for injunction *pendente lite*, Mercantile Trust & Deposit Company of Baltimore *vs.* Columbus Water Works Company, *et al.*, 130 Fed. 180. It is there held that—

"A Federal Court will follow the law as established by the Supreme Court of the United States, that a contract by a city to pay an annual rental to a water company does not create an indebtedness of the city, within the meaning of a provision of the State Constitution which would render such an indebtedness illegal, where at the time of the making of the contract in dispute the law of the State had not been settled otherwise by its Supreme Court, although that Court may have subsequently declared such contract invalid."

In rendering this decision the Court quotes at length and approvingly the decision in the case of Columbia Avenue, etc., Trust Company *vs.* City of Dawson, *et al.*, and cases therein cited, and notably the case of Walla Walla *vs.* Walla Water Company (172 U. S. 1, 43 L. Ed., 341), wherein it is said that such a contract does not create a debt is not an open question in this forum. In this Dawson case Circuit Judge Pardee approves the conclusions embodied in the report of the Master, and the same are set out in full as the law governing this question. In that report the Master discussed at length
181 the effect and state of the decisions of the Supreme Court of Georgia at the time the contract then under consideration was executed, and from the citations therein made on the question under consideration it will be seen that the decisions of the State Court

were quite as favorable to the validity of the contract in the instant case as they were at the date of the contract in the Dawson case.

I therefore conclude that the contract in question did not create a debt in violation of the Constitution of Georgia.

III.

The complainant alleges that the provision of Section XI of the contract, wherein the City agreed to accept bond coupons of the Water Company in payment of taxes, was an element of credit on the part of the City which enabled the Water Company to sell the bonds at a better price than could have otherwise been done, and that this was an inducement permitted by the City to be held out to the innocent purchasers of the water bonds. The exact language of paragraph XV has been hereinbefore set out. To put the construction as thus claimed would virtually be committing the City to the position of having loaned its credit to the Water Company. This is expressly forbidden by the Constitution of Georgia, which in paragraph I, Section 6 of Article 7, declares that no municipality shall loan its credit to any corporation, association or individual except for charitable purposes. (Civil Code Georgia 1895, Section 5891.) But if this construction were permissible the facts show that the purchasers of the bonds were not misled. I have found as a matter of fact that the syndicate who originally bought these bonds took them with full knowledge of the condition of the property, and the terms of
182 the contract, and that the present holders purchased from this syndicate on representation made by it. Both the Water Company, and the purchasing bond syndicate, and those holding from them, are chargeable with knowledge of the power of the City and of the laws of the State as bearing upon the contract. L. & N. R. R. Co. *vs.* Kentucky, 161 U. S., 691, (L. Ed. 40, 856.) The paragraph however is not susceptible of such construction. The indebtedness would only accrue as the Company performed its obligation. Reference is made in the face of the bonds to the trust deed securing the same, and this in itself would put holders of bonds on notice, or demand of them to enquire, as to the relation of the contracting parties. The contract is an executory and continuing contract, and the language of paragraph XI means only that so long as the Water Company complies with its contract, and the city was indebted to it for service, it would accept coupons in payment of any taxes due to the extent of what it might owe for water during the current year. Farmers' Loan & Trust Company, trustees, *et al.*, *vs.* City of Galesburg, 133 U. S., 156 (33 L. Ed., 573).

I therefore conclude that Paragraph XI is neither an absolute guaranty of payment by the City, nor is it an element of credit.

IV.

Did the City have the power to grant an exclusive franchise in this contract, and if not, how far is the grant in this contract to be construed as exclusive?

It is conceded that the authority under which the City acted rested along upon the general welfare clause of the charter hereinbefore

quoted. It was contended by the able counsel for the de-
183 fendant that if the franchise granted under this contract was to be construed as exclusive, there was no such power expressly delegated by legislative enactment, and the legislature itself was forbidden by the Constitution of the State to make irrevocable grants of special privileges or immunities, and therefore the grant in this case was illegal. It was urged with great force that it is beyond the power of the City to grant an exclusive franchise so as to create a monopoly and deprive its citizens of the right to obtain a wholesome and adequate supply of water for sanitary and domestic purposes and for protection against fire. On the other hand, the learned counsel for complainant insisted that this question had been settled by the decision in the case of the City of Dawson and cases there cited. In the City of Dawson case, *supra*, the grant was for "the exclusive right and privilege for the period of ninety-nine years of constructing, maintaining and operating a system of water works for the purpose of supplying the City and its inhabitants with water for protection against fire and for domestic, sanitary and other useful purposes." Whether the City of Dawson, in the execution of its contract, acted under the "general welfare" clause of its charter or by express authority does not appear, but it does appear that after the execution of the contract the General Assembly of Georgia recognized the existing contract by enacting legislation for the protection of the water works constructed under the contract.

The language of the contract in the instant case is as follows: Par. XIV.

"The Mayor and Council are to grant a franchise for the exclu-
sive privilege of maintaining and operating the works for a
184 period of thirty (30) years, or until such time as they may be purchased by the City," and during such time the City agrees to pay hydrant rentals at a rate named. In both instances the privilege was granted for the occupation of the streets of the City in constructing the system. This was a necessary incident to the performance of the contract. It was contended in the Dawson case, and is also in the instant case, that no exclusive franchise to occupy the streets and maintain a water system could be lawfully granted, and from this it is argued that the franchise may be revoked and the City may use its streets for its own system. The Court in considering this question, in its decision on the application for the injunction *pendente lite*, quoting from the language of the opinion in the Dawson case, says: (130 Fed. 180.)

"The grant of a right to supply water to a city and its inhabitants through pipes and mains laid in the streets, upon the *condition of the performance of its service by the grantee*, is a grant of a franchise in consideration of the performance of a public service, and *after its performance* by the grantee, is a contract protected by the Constitution of the United States," citing the case of Walla Walla *vs.* Walla Walla Company, 172 U. S., 1 (43 L. Ed. 341) and cases therein cited.

It does not follow that the grant was lawful *ab initio*. It has been seen that the right of a City to do those things necessary to supply

its inhabitants with water for domestic use, or to provide the City with fire protection, is the settled law of Georgia. This power must of course be exercised in such manner as to not be in conflict with the law either of the State or the United States. In the Walla Walla case there was an express grant by the State to the City
185 of power to erect and maintain water works, or to authorize the erection of the same, and the Court in its opinion on this case makes special reference to that provision of the charter. No such power was given by the charter of the City of Columbus, nor has the Legislature since the date of the contract, either by direct or indirect enactment, recognized or confirmed the City's action. On the contrary there has been express authority given the City by the Act of 1902 to construct, own and operate its own water works system. It is well settled that only the Legislature, acting directly or through special power expressly delegated to a public corporation, for example, as in this case to a municipality, can grant an exclusive right or franchise. Such a power either on the part of the State or of a municipality is never implied: Unless the power is expressly conferred in certain terms, its existence is denied. Minturn *vs.* LaRue, 23 How. 453, 18 L. Ed., 574; Wright *vs.* Nagle, 101 U. S. 491, 25 L. Ed. 921; Freeport Water Co. *vs.* Freeport, 180 U. S. 587, 45 L. Ed. 679; Hamilton G. & C. Co. *vs.* Hamilton, 146 U. S. 218, 36 L. Ed. 963; Detroit, etc., R. Co. *vs.* Detroit, etc. Co. 171 U. S. 48, 43 L. Ed. 67; Capital City L. & F. Co. *vs.* City Tallahassee, 186 U. S. 401, 46 L. Ed. 1219; Jackson Co. R. Co. *vs.* Interstate etc. R. R. Co. 24 Fed. 306; Saginaw Gas Co. *vs.* Saginaw, 28 Fed. 529; Grand Rapids etc. P. Co. *vs.* Grand Rapids Co., 33 Fed. 659; Illinois etc. Bank *vs.* Ark. City, 76 Fed. 271, 34 L. R. A. 518; *In Re* Brooklyn 143 N. Y., 596, 26 L. R. A. 270; Walla Walla *vs.* Walla Walla Water Co., 172 U. S. 1, 43 L. Ed. 341.

186 In the last case cited the Court on page 347 (L. Ed.) says: "Had the privilege granted (in the contract) been an exclusive one, the contract might be considered objectionable upon the ground that it created a monopoly without an express sanction of the Legislature to that effect."

The charter of the City of Columbus not giving the right, and the State not having either directly or indirectly confirmed the grant, I conclude that the City of Columbus, at the date of the contract with the Columbus Water Works Company, had no power to grant to said Company an exclusive franchise for the construction and operation of a water works system, and that any attempt on the part of the City to make such a grant was *ultra vires*. This does not however invalidate the entire contract but the contrary has been held. Quincy *vs.* Bull, 106, Ill. 337, 61, L. R. A. 68. The above conclusion however is based upon the theory that the grant of an exclusive franchise in this case was construed to mean that the City would not only not compete with the Water Company in the business of supplying the City with water, but engaged not to confer a similar franchise upon another. 76 Fed. 271; 28 Ill. Tr. & S. Bk. *vs.* Arkansas City. Were the City of Columbus again undertaking to exercise this power for the benefit of a third person, the force of this conclusion might

be urged; but in the instant case a very material question arises as to whether or not the City, even if acting *ultra vires*, can avail itself of the benefit of its own illegal act and enter into competition with the present grantee after there has been an exercise of the rights granted under the contract. As has been seen in the ruling in the Walla Walla case, the contract will be protected after performance by the grantee.

187 In the numerous decisions of both State and Federal Courts upon the grant of franchises for public utilities, the Courts have drawn a distinction between a contract regarded as one entire business venture in the exercise of its business powers by a municipality, and the grant of an exclusive franchise in the general acceptation of that term, not as an incident of the contract by which the City contracts to pay money for its services, or other thing of value, but as a privilege or franchise in its capacity as a governmental agency. This distinction is clearly drawn in the Walla Walla case, and also in the case of Vicksburg Water Works Co. *vs.* Vicksburg, 185 U. S., 82, L. Ed. 46, 814, and Los Angeles *vs.* Los Angeles City Water Co., 177 U. S., 558, L. Ed. 44, 886; 61 L. R. A., 69 (note): In the first case the Court says:

"The objections urged to the validity of the contract because it undertook to bind the city for a period of thirty years, because an attempt to barter away the legislative power of the city was considered at length in the Walla Walla and Los Angeles cases (citing them) and has been found to be untenable."

While it is true that without express authority a city cannot grant, in its governmental capacity, an exclusive franchise, it is very evident that in the exercise of its proprietary powers it may contract with another party for a supply of water, and engage during the period of the contract not to enter into competition with the grantee, but the contract must be clear and show beyond question what was the intention of the parties. Ill. Tr. & S. Bk. *vs.* City Ark. 76 Feb. 282 and cases cited. The question after all, in this branch of the case at bar, is whether or not it was the intention of the

188 parties that the City was, for the period of the contract, not to enter into competition with the Water Company. In deciding this we must look to the language of the contract. There can be no implied obligation that the City will not, within the contractual period, construct its own system and enter into competition with the Water Company.

This question of implication in such contracts as the one under consideration has been recently passed upon by the Supreme Court of the United States (Nov. 16th, 1903) in the case of Joplin *vs.* Southwest Miss. Light (191 U. S. 150). In that case the facts were, the statute of Missouri provided that a city might erect and operate electric lights or water works, or it might grant such right to any other person or corporation upon such terms as might be prescribed by ordinance. The City of Joplin granted this right to a private corporation; subsequently the City undertook to erect its own system. The Circuit Court held that the City could not thus

enter into competition with its grantee and so to destroy or greatly impair the value of the franchise. 101 Fed. 23 and 113 Fed. 817. This case as reported below was cited as the authority for the ruling on this point in the City of Dawson case (*supra*). Since that ruling the Supreme Court has reversed the lower Court, and held that no implied contract that the City will not, during the term of the grant, enter into competition, arises from a municipal grant of a franchise to others, where such grant is not exclusive. The Court said:

"That the limitation contended for was upon a governmental agency and restraint upon that must not readily be implied; that such a limitation would give the Light Company a practical
189 monopoly, and that the presumption is against the granting of exclusive rights and against limitation upon the powers of government."

The case of Skaneateles Water Works Company *vs.* Skaneateles, 184 U. S., 354, 46 L. E. 585, and Bienville Water Supply Co. *vs.* Mobile, 175 U. S. 109, 44 L. E. 92, are cited to sustain the conclusion, and it is declared that there is nothing inconsistent in the Walla Walla case. Referring to this last case, it is pointed out that the contract is explicit; that the City would not during the life of the contract erect or become interested in another water works; that the contract was in force and that there had been substantial compliance with its terms by the Company at the time the suit was brought. In the Skaneateles case the contention was that as the village had an election of constructing its own water works, or conferring the power, and having elected the latter, it impliedly contracted not to erect its own works. In reply to this the Court, by Mr. Justice Peckham, said:

"There is no implied contract in an ordinary grant of a franchise, such as this—that the grantor will never do any act by which the value of the franchise granted may in the future be reduced. Such a contract would be altogether too far-reaching and important in its possible consequences in the way of limitation of its powers of a municipality, even in matters not immediately connected with water, to be left to implication."

The contract in this case had expired before the village erected its works.

Counsel for the defendant laid great stress upon the effect of the final decision in the Joplin case, and sought through it to take the instant case out of the force of the applicability to it of the City of Dawson case, urging that the report of the Master in that
190 case, and its subsequent approval by the Court, was based on the rulings of the Joplin case as expressed in the decision of the lower Court, reversal of which has been made by the Supreme Court. I take it that the principle decided by this last decision of the Joplin case is, that where there is an existing contract between a municipality and another, in which the grant of a franchise or privilege for the performance of a public duty is not explicitly and

expressly set out, there can be no implication as to what was the intention of the parties.

As the Court said: "In this case restraint upon the power of the city is claimed to be implied by the grant to the appellee." The ruling briefly expressed is that it is not admissible to read into a contract what does not clearly appear as embodied therein. Nothing will pass except what is granted in clear and explicit terms. City of Helena *vs.* Helena Water Works Co., 58 C. C. A. 381; Stein *vs.* Bienville Water Supply Co., 141 U. S. 67, 35 L. Ed. 622.

With this as the rule, it therefore becomes important to ascertain whether or not, under this contract, the City of Columbus clearly intended not to enter into competition with the Water Company during the life of the contract. It is within the power of the Court to construe all contracts brought before it for consideration.

Section XIV of the contract declares that, "the Mayor and Council are to grant to the contracting parties a franchise for the exclusive privilege of maintaining and operating the works for a period of thirty years, or until such times as they may be purchased by the City," the City agreeing to pay annual rentals. Sec-
191 tion XXI reserves the right to certain piping located in certain streets at the date of the contract for certain specified purposes of fire protection, but not to be used for other water supply after the completion of the works without the grantee's consent. Section XVII specifies certain public purposes for which the water is to be used by the City, free of all charges except the amount due by the grantee to the City for taxes. A scale of prices, both for the City and private consumers, is fixed by other sections; filling public cisterns at a specified rate from the water Company's pipes is provided for in Section XIV, and so also a similar provision is made by Section XX for flooding the streets and sewers of the City. By Section XXVI the City provides for the reduction of rentals. Section XXXVII provides that neither public fountains, or other public water, are to be used for private purposes except by consent of both parties to the contract. Section XLII reserves the right in the City to purchase at intervals of 15 years. This last I construe to mean within the contract period of 30 years, and that beyond that the contract for all purposes is terminated, and no longer of force, unless renewed by the contracting parties. This feature of the contract does not therefore give the instrument the element of perpetuity as argued by counsel for the defendant. Section X provides that the grantee shall select the source of water supply, and the same shall be wholesome and sufficient to meet the present and future wants of the City. In Section XLVII the contract provides for forfeiture under certain conditions.

Taking the express language of the grant and reading these several sections referred to in connection therewith, and in connection
192 with the instrument in its entirety, it seems to be clearly expressed that it was in the minds of both contracting parties that, at the time of the execution of the contract, these water works were to be maintained and operated by the grantee for the period of

thirty years, from the date of the acceptance of the works, to the exclusion of the City entering as a competitor. The contract being executory, it necessarily followed that the privilege, or license, therein granted was conditioned upon the performance by the grantee of the several undertaking and promises therein set out. The correctness of this view is further strengthened by the manner in which the parties dealt with each other from the completion of the works to the passage of the ordinance of September, 1902. The Water Company, as early as 1886, found it necessary to endeavor to remedy defects complained of by the City. The City, from time to time, complained to the Company that it was not properly performing its undertakings, and on two distinct occasions, prior to 1902, the voters of the City were asked to ratify the action of the Council in a proposed plan of erecting works of its own. Again in 1898 the City, after prolonged consideration of how to provide water for newly acquired territory, made with the Company an agreement, supplemental of the original undertaking, by which this could, if possible, be carried out by the grantee in the original contract.

I therefore conclude that the grant of the franchise in this contract is to be construed to mean that the City would not enter into competion with the Water Company as long as the contract for supplying water to the City could be complied with on the part of the Company, and that the grant was permissible as an incident to the performance of the principal undertaking.

193 V.

The defendant insists that, even if the Water Company had acquired an exclusive franchise, it has been revoked by the State in the grant of the authority to the City of Columbus to construct its own system of water works as expressed in the Act of the General Assembly of Georgia, approved December 3rd, 1902. (Acts 1902, page 370.) Complainant on the other hand claims that the effect of this Act is to impair the obligation of the existing contract. The first section of the Act is simply an enlarged expression of a right, which I have found previously existed in the City under the general welfare clause of its original charter, of which this Act is amendatory. The remainder of the Act refers to the establishment of a water commission, power to issue bonds, and other details not here pertinent. The last section repeals conflicting laws. I have defined the grant in the contract not to be exclusive in its general sense, and have shown that it could be exclusive only as to the right of the City to compete with the grantee so long as there was compliance with the contract. It will be necessary therefore only to consider the effect of the Act of 1902 on the grant as thus defined. I have found that the contract, in express terms, gives the right to the Company to operate its works exclusive of competition by the City. Is it in the power of the Legislature, by this Act of 1902, to directly or indirectly revoke the contract rights of the Water Company and permit the City to enter into competition with the Water Company, and thereby destroy the value of the property of the Company? The question is answered in the

case of Trust Company *vs.* City of Dawson, 130 Fed. 173, wherein it is stated:

194 "The City may not, prior to the expiration of the term for which it contracted for a supply of water * * * directly revoke the grant of the franchise for the use of its streets by the Water Company, or indirectly impair or destroy the value of the franchise by itself entering into competition with its grantee. To this extent the right is protected by the obligation entered into," citing St. Tammany Water Co. *vs.* N. O. Water Co., 120 U. S. 64, 30 L. Ed. 563; Louisville Gas Co. *vs.* Citizens Gas Co., 115 U. S. 683, 29 L. Ed. 510; Bartholomew *vs.* City of Austin, 85 Fed. 359, 29 C. C. A. 569.

To escape the force of this ruling, and give effect in the present case to the Act of 1902, counsel for defendant invoke the right of revocation reserved by the State in Art. 1, Par. 2, of Sec. 3 (Code 5730) of the Constitution of Georgia, in which paragraph the grant of special privileges is forbidden, and cite Macon & B. R. R. Co. *vs.* Gibson, 85 Ga. 1. Paragraph 3, Art. 1, Sec. 3 (Code Sec. 5731) of the Constitution of Georgia provides that no grant or special privileges or immunities shall be revoked except in such manner as work no injustice to the corporators or creditors of the incorporation. The Supreme Court of Georgia in this case cited of R. R. Co. *vs.* Gibson has held as follows:

"No constitutional principles are infringed by exercising a reserved power to revoke special privileges or immunities, unless the provision of our own Constitution is violated which forbids doing it in such manner as to work injustice to the corporators or creditors of the corporation. Whether the mode adopted by the Legislature in a given instance is just in this respect or not, whilst primarily a Legislative question, may, if palpably decided wrong, become a judicial question."

In the same case Chief Justice Bleckley, quoting Cooley, Jr., in Detroit, *vs.* Detroit Co., 43 Mich. 40 says:

"It cannot be necessary at this day to enter upon a dis-
195 cussion in denial of the right of the Government to take from either individuals or corporations any property which they may have rightfully acquired. It is immaterial in what way the property was lawfully acquired, whether by labor in the ordinary avocations of life, by gift or descent or by making profitable use of a franchise granted by the State; it is enough that it has become private property and is then protected by the 'law of the land.'"

Defendant further contended that the Supreme Court of the United States, in discussing the meaning of the provisions of the Constitution of Alabama, which are similar to those of Georgia in the paragraphs referred to, in the case of Bienville Water Supply Company *vs.* City of Mobile, *et al.*, 186 U. S., 212, L. Ed. 46, 1132, had held that the absolute power of the Legislature of Alabama, as reserved in one paragraph of its Constitution, to revoke the exclusive feature of a franchise, is not limited to cases where no injustice will thereby be done the corporators as provided by another paragraph. But in this case, (page 221) the Court, through Mr. Justice Brewer, says:

"Obviously from the several constitutional provisions which are

quoted in the statement of facts, it was intended that the Legislature should have the right of revocation and amendment, and that whoever took a charter should take it subject to that right. To what could such revocation or amendment extend? The possible rights of a corporation group themselves into three classes:

First. The right to the tangible property which it may acquire. Second, the right to do specific things which are named in the charter, and third, the right to exclude others from doing like things. It has been held that the right of revocation or amendment carries with it no right to appropriate the tangible property belonging to the corporation, as said by Chief Justice Waite, speaking of the power of amendment in Sinking Fund cases, 99 U. S. 700, *sub-non* Union
P. R. Co. *vs.* United States, 25 L. Ed. 496: "All agree that it
196 cannot be used to take away property already acquired under
operation of the charter, or to deprive the corporation of the fruits actually reduced to possession of contracts lawfully made." Nothing of this nature was, however, attempted by this legislation. No, we need not stop to consider what protection could be afforded if the attempt had been made to take away its property. The second class includes the powers of action granted to the corporation; in other words, the right to use the tangible property for the purposes of the charter, but none of these powers were taken away from the plaintiff. Hence no enquiry is pertinent in respect to the limitations, if any there be, on the right of the Legislature to take away such powers."

The Court then discusses those rights which flow from the exclusive provisions in the charter, the right to prevent others from doing the same thing. It is unnecessary to quote the opinion on this last point in view of the conclusions heretofore reached that the City in the instant case had the right to contract with the Water Company not to compete, and that the Company would be protected in this agreement if it has complied with the terms of the contract. From the rule laid down by the Georgia Supreme Court and the United States Supreme Court in discussing these similar provisions of the Constitutions of Georgia and Alabama, as well as within the ruling of this Court as cited in the Dawson case, the Act of 1902 cannot be construed as a revocation of the grant made by the City to the Water Company in virtue of its reserved power of revocation, but on the contrary such construction would be in violation of the contract rights of the Water Company were the City, nothing else justifying it, to endeavor to abrogate its contract obligation under authority of this Act. It is evident that such a course would in a
large measure, if not entirely, destroy valuable tangible prop-
197 erty already rightfully acquired by the Water Company.

This conclusion, however, is only applicable to this effect of the Act of 1902 abstractly considered. In a review of the case at bar as a whole, other questions may control in the City exercising its right to rescind the contract, and these will be hereinafter considered.

VI.

It is contended that the City has the right in this case to the exercise of its police power to provide for another supply of water.

I have found that the Water Company has failed in the several particulars as set out in the findings of fact in the performance of its undertakings to supply the City with an abundance of pure and wholesome water, amply sufficient for domestic uses and for protection against fire. The City and its inhabitants were entitled to an abundant supply of wholesome water, and this sufficient to meet the wants of the City as it has increased and will further increase in area and population. It is the duty of those charged with the business affairs of the City to see that this is accomplished. If this duty has been delegated to another, and there has been failure in its performance, as has been found in this case, the City not only has the right but is under the imparative duty of making provisions for an adequate supply of wholesome water. Under conditions existing at the time of the passage of the ordinance in September, 1902, and at the time of its practically unanimous ratification in December thereafter, and for a long period prior thereto, it was evident that the Water Company was not only unable to do so, but had failed
198 to supply the needs of the City. The water was impure and deleterious to public health, and had been condemned both by the Board of Public Health and by chemists called upon to analyze it. The citizens were forced to purchase water for domestic use and the fire protection was uncertain. In these conditions the City was justified in taking steps to provide for a different and adequate system of water works, and in the exercise of its police power had the legal right to do this. There is nothing in the Walla Walla case to negative his proposition. There the Court say:

"If a contract be objectionable in itself upon these grounds, (that is, that it is prejudicial to public health) or if it become so in its execution, the municipality may, in the exercise of its police power, regulate the manner in which it may be carried out, or may abrogate it entirely, upon the principle that it cannot bind itself to any course of action which shall prove disastrous to the health or morals of its inhabitants." Walla Walla *vs.* Walla Walla Water Company, 172 U. S. 1, 43 L. Ed. 347.

In the case of Boston Beer Company *vs.* Massachusetts 97 U. S. 28, 24 L. Ed., 989, Mr. Justice Bradley, speaking for the Court, says:

"Whatever differences of opinion may exist as to the extent and boundaries of the police power, and however difficult it may be to render a satisfactory definition of it, there seems to be no doubt that it does extend to the protection of the lives, health and property of the citizens and to the preservation of good order and the public morals. The Legislature cannot by any contract divest itself of the power to provide for these objects. They belong emphatically to that class of objects which demand the application of the maxim, *'Salus populi suprema lex,'* and they are to be attained and provided for by such appropriate means as the Legislature may devise."

This rule applies of course with equal force to the governing

power of a municipality as a subordinate branch of the State
199 government. In Butchers' Union Company *vs.* Crescent City Co., 111 U. S., 746, 28. L. Ed., 585, it was clearly stated that, with regard to public health and public morals, there could not possibly be any limitation on the legislative power. The ordinance, the operation of which is herein sought to be restrained, declares in express terms the underlying reason of its enactment to be "that the Water Company has failed to supply the City with a sufficient quantity of pure and wholesome water," and that "the public health of the City is paramount in importance to every other consideration." While it is true that this question has been made in the demurrer to the amended Bill, and overruled, that judgment was based upon the facts as then appeared from the face of the pleadings. The conditions as shown to exist in the findings of fact herein set out have led me to the conclusion that the enactment of the ordinance was, under the rulings as herein cited, clearly within the exercise of the police power of the City, and not only justifiable but imperative. It is contended that this was not the sole motive of the City, the additional reasons for the ordinance being that it would be in the interest of economy, and it was argued that the City did not recognize the validity of the existing contract, and had repeatedly so declared. I do not think any action of the City prior to this time in any way on this question, affects the present case, and the reference in the ordinance to economical reasons was merely incidental. The true reason underlying the attempted repudiation of this contract in the preceding years seems to have been popular discontent at the repeated inefficiency of the water works system, but, — has been shown,

the citizens refused to endorse the efforts of its Council to
200 repudiate the contract and evinced, by a popular vote, its willingness to permit the Water Company further time in which to endeavor to carry out its contract. The Council itself finally abandoned any effort at repudiation or abrogation, and on the contrary entered into a supplemental agreement, thereby signifying its willingness to give to the Company further opportunity to perform its undertakings. The findings of fact show that the City had, at the time of the final failure, outgrown the water system, and that the Water Company was unable to meet the requirements of the City. This is virtually admitted in the foreclosure proceedings, the reason assigned being that the Company was without funds, and not only because of the City's action, but from other causes. Clearly the City had the right, in the exercise of a duty it owed in protecting the welfare of the citizens, to take immediate steps under existing conditions to supply the inhabitants with water, and yet in the exercise of this important prerogative of the police power there must be no violation of vested rights. The power must be exercised within constitutional limitations. People *Ex Rel.* Tyroler *vs.* Warden, 51 N. E. 106, S. C. 157, N. Y. 116; Priewe *vs.* Wisconsin, 67 N. W. 918.

"A law embracing and penetrating as the police power of the State must be thus nevertheless subject, like all other legislative powers, to the paramount authority of the State and Federal Constitutions. A right conferred or protected by the Constitution cannot be over-

thrown or impaired by any authority derived from police power." Vol. 1, Dillon on Municipal Corporations, Section 142, pages 213, 214.

The mere assertion in the Act by which the power is proposed to be exercised that the same is necessary, does not make the
201 Act conclusive upon the courts. The City cannot make itself the judge. "The right must be exercised subject to the power of the Court to judge whether any particular law is an invasion of the right secured by the Constitution." City Richmond *vs.* Telephone Co., 85 Fed. 19; the Circuit Court of Appeals for the Fourth Circuit citing Mungler *vs.* Kansas, 123 U. S. 623.

In reviewing the Walla Walla case, so frequently cited as controlling questions made in the instant case, it will be seen that there was an attempt to avoid that contract through invoking the right of the City to the exercise of its police power. What the Court decided upon this point in that case was that the contract was not void as an attempt to barter away the police power of the State, so as to justify its abrogation or impairment when the water supply is innocuous and the contract is carried out with due regard to the good order of the City and the health of its inhabitants. (Page 15 of the L. Ed. page 347.) Moreover, there was a special provision in that contract (not incorporated in the contract under consideration) that it should be voidable by the City upon the judgment of a court of competent jurisdiction, whenever there should be a substantial failure on the part of the Water Company to keep its agreement, and that until so avoided the City should not erect water works of its own. On page 23, L. Ed. page 350, the Court says:

"But we do not think it within the power of the City to constitute itself the judge and to proceed to erect water works of its own upon the theory that the Company had failed to carry out its contract without, in the language of Section VII, obtaining the judgment of a court of competent jurisdiction to that effect. As the sec-
202 tion provides the manner in which the failure of the Company shall be legally established, we think the City was bound to purchase this course before taking steps to erect water works of its own."

"Whether, if a sudden emergency arose, requiring immediate action on the part of the City to provide a further supply, or to preserve the health of its inhabitants, a preliminary avoidance of the contract would be necessary is a question not involved in this case, and upon which we express no opinion. There was no pretense that the water was impure, and the evidence was conflicting upon the sufficiency of the supply."

It is true that in the present contract provision is made by Section XIII for experts to be appointed to test the quality of the water should the same become unwholesome, and if so found the City could order its use either limited or cut off, and it is contended that under this provision the City could take no steps to protect its citizens against unwholesome water until this was done. This provision was to enable the contracting parties to determine a question which might be in doubt. The facts in this controversy are found to be that

both the Company and the City knew that the water was not only unwholesome, but had entirely failed in September, 1902, and that for several months thereafter, and before the ratification of the ordinance, river water, equally unwholesome and unfit for use, had to be resorted to. It was evident that "a sudden emergency had arisen requiring immediate action."

In the present contract there was no obligation on the part of the City to appeal to the Courts before an attempt to exercise its police power in protecting its citizens, but the action taken was of course subject to review by the Courts and now properly here. That the step taken by the City was not unreasonable, is shown by the
203 action of the Court itself in at once directing its Receiver to take immediate steps to endeavor to remedy conditions, and further in removing its temporary restraining order when it was found this could not be done, but without prejudice, and in further directing the Receiver to discontinue the use of river water at the place from which the Company had been serving it to the City.

What is meant by the several rulings of the Court upon the exercise of the police power, as these rulings may be applied to this case, is, that the Court will when the question is properly presented, as it has been in the instant case, constitute itself the judge of its rightful use and will in permitting its exercise protect the rights of all parties. In other words, that the exercise of the police power is neither above nor beyond the control and regulation of the Court.

I conclude that, from the facts in the case at bar, the City had a right, in the exercise of its high duty of protecting the health of the inhabitants of the City, to take such steps as it saw proper to provide means to supply to the people wholesome and abundant water, and could therefore enact the ordinance here sought to be set aside, subject however to a proper adjudication of the contract rights of those affected by the exercise of the power. To what extent this act of the City should be allowed to effect the rights of the Water Company and its creditors will hereinafter be considered.

VII.

It is contended that the City, having accepted the system under the contract as originally constructed by White in 1882, is now estopped from denying the validity of the contract, or taking any step
204 which will in effect abrogate the contract. I have found that this acceptance was made on the assurances by the Water Company that the works were so constructed as to carry out the purposes intended and that the Company would comply fully with all of its terms. This the Company has failed to do in many particulars as found by the facts, but notably in failure to construct and keep the reservoirs as required, to add additional supply or sources of supply; to supply pipes sufficient to afford required pressure at all times, and to properly connect its mains; to provide a proper filter and sufficient supply mains; to at all times afford wholesome and abundant water. The Company was not excused in the performance of these undertakings by the conditional acceptance of the system by the City,

nor because of complaints of the people, or the Council, or from unusual droughts, or because of want of funds.

"The course of the City has been forbearing and generous towards the Water Company. The contract was an entire one, and was not executed by a partial performance as to one of the several undertakings on the part of Shelton (White in the instant case) and his assigns; and they assumed all the risk of obtaining a water supply sufficient in quantity and quality to comply with their contract." Farmers' L. & T. Co. *vs.* City of Galesburg, 133 U. S. 156, L. E. 33, 579.

It is true, as a general principle of law, that in ordinary contracts an acceptance waives all defects which could have been discovered at or before the time of such acceptance. 62 Fed. 853, National Water Works Co. *vs.* Kansas City. In that case it was held that the City, having for many years recognized and accepted the system as constructed in full compliance with the contract, could not maintain a claim for damages because the works had not met the requirements of the contract as to efficiency. This is not the present case. On the contrary the City has, from time to time, at frequent intervals, protested against the character of the service and the efficiency of the system and brought its protests to the attention of the Company, and has given the Company every opportunity and reasonable time to test its ability to carry out the contract. It has been found as a matter of fact that the Company was unable to carry out the provisions of the contract, and for causes not arising altogether, at least, from the conduct of the City. In more than one instance the City withheld the payment of water rentals in order to force compliance with the contract on the part of the Company.

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In Farmers' Loan & Trust Co. *vs.* City of Galesburg, *supra*, Mr. Justice Blatchford, speaking for the Court, says:

"The principal contention on the part of the appellants is that on the acceptance of the ordinance by Shelton (the grantee) a right in the franchise vested in him, which could not be defeated even though he afterwards failed to comply with its terms; that the failure of the Water Company to furnish water in the quantity and of the quality called for by the ordinance was only a breach of a condition subsequent; and that a court of equity will not lend its aid to devest an estate for such a breach. But it seems to us in respect to a contract of the character of the present one, the ability of the Water Company to continue to furnish water according to the terms of the ordinance was a condition precedent to the continuing right of Shelton and his assigns to use the streets of the City, and to furnish water for a period of thirty years; and that when, after a reasonable time, he and his assigns had failed to comply with the conditions as to the quantity and quality of the water, the City had a right to treat the contract as terminated, and to invoke the aid of a court of equity — enforce it re-cission."

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It was further contended that the City not only accepted the works, but did so after a test made and approval by a committee of Council and of citizens and is therefore estopped. It is true a committee made a test of these works and in the beginning reported them

satisfactory, but such a test and acceptance thereon was not conclusive against the City. In the Galesburg case above cited on this point, where the facts were almost identical with those of the instant case, the Court say on page 582, L. Ed.:

"Nor could the test required by the ordinance and satisfactorily made by the Water Company be a test of anything but the pressure power of the works. It could not be a test of the quantity of water which would thereafter be supplied by the works, nor of its continuing quality for domestic purposes."

I therefore conclude that the conditional acceptance of this system by the City in 1882, and its continued acceptance of service since that time, does not now estop it from seeking affirmative relief as set up in its Cross Bill. As before stated the Water Company has by its own admissions shown its inability to maintain and operate the works and from causes not wholly chargeable to the conduct of the City.

VIII.

It was insisted by Counsel for complainant that there were reciprocal obligations upon the City, as provided in the present contract, which should have first been complied with before demanding an abrogation or forfeiture of the contract, and that the City, not having established defects as provided by the contract, it is estopped
207 from charging that the system is inadequate, and further that defects in the service since 1891 have been brought about by the conduct of the City. In the exhaustive brief submitted these questions are discussed at length, and many cases cited to sustain the contention. I deem it unnecessary to here go into details with reference to them. The facts as here found do not sustain the contentions, and it may be stated in general terms that the continued default and inability of the Water Company relieved the City from its reciprocal obligations. Lynn *vs.* Pollard, 20 Wall. 403, 22 L. Ed. 361; Ohio Steel Etc. Co. *vs.* Washburn Etc., 26 Fed. 702. That the Company has failed to supply the City with water under the terms of the contract is abundantly shown by the evidence, and this is especially true since July, 1902, and, as hereinbefore referred to, it has admitted its inability and placed the responsibility of further undertaking to carry out the contract upon the holders of the bonds of the Company.

IX.

It is contended that under Section XLII of the contract the City is obligated to offer to purchase from the grantee the system of water works at periods of fifteen years during the life of the contract, and that until such purchase is made the rights and privileges of the Water Company will continue in force, and hence any attempt, directly or indirectly, by the City to erect its own system will be in violation of the contract rights of the Company. The provisions of this section cannot be construed to obligate the City to a pur-
208 chase of the system. It has been held that a City cannot thus bargain away the discretionary power of succeeding administrations and thus tie the hands of the public.

"A municipal corporation cannot make a valid contract abrogating or restricting its legislative or discretionary power; and an agreement by which a city undertakes to divest itself of such power cannot be used as the foundation for an estoppel against it." Macon Consolidation Railway Co. *vs.* Mayor and Council of City of Macon, 112 Ga. 782, and cases therein cited.

"Where the subject matter of a contract concerns the interests of the public, the contract is to be construed liberally in favor of the public." Joy *vs.* City St. Louis, 138 U. S. 1, 34 L. Ed. 843.

I construe this clause of the contract providing for a purchase of the works conditionally to have conferred a mere privilege upon the City which it had not seen proper to exercise.

X.

I have found the estimated value of the distribution system, with the river as a source of supply, to be $176,562.62. These figures are ascertained from the evidence of cost of reproduction at a certain stated time and value of betterments added since that time. There was no inventory in evidence and the Company failed to show values of the property except in a general way. I have, in reaching this value, followed the rule for valuation of water works systems as defined by Mr. Justice Brewer, sitting as Circuit Judge in the case of National Water Works Co. *vs.* Kansas City, 62 Fed. 864, 10 C. C. A. 653, 27 L. R. A. 827.

"The fair and equitable value of the works (the water works system in that case) should not be determined by capitalization of the earnings, * * * nor should such value be limited to the
209 cost of reproducing the plant, but allowances should be made for the additional value created by the fact of connections with and supply of buildings." See also Gloucester *vs.* Gloucester, 179 Mass. 365, 60 N. E. 977.

Following this rule and applying the evidence of values as shown in the findings of fact, I have based the estimate of value on what would be the cost of reproducing the distribution system, that is the part lying in the City of Columbus, and have added ten per cent. as the value of present connections or for what may be termed the going concern. In arriving at the valuation above named I eliminated, as will be seen in the findings of facts, all consideration of the property of the system lying in Alabama and of the 4-inch mains. While these 4-inch mains may have been laid at the instance of the City authorities as being the cheapest under Section XXVIII of the contract, this did not relieve the Company from connecting together these mains at close intervals and eliminating dead ends. This section must be read in connection with Section XL of the contract in which the Company obligated itself to so construct the system as to admit of enlargement without remodelling or altering the street mains for many years to come. The evidence, it will be remembered, shows that since 1895 the Company, of its own accord, ceased to lay any more of these 4-inch mains.

XI.

It is important to enquire as to what are the rights of the bondholders, and to decide to what extent the Court will protect the large interest they have in the property involved in this litigation.

The proposition of the complainant is that "the bondholders
210 be permitted to undertake to carry out the contract, and with the aid of the Court, in this undertaking, to perform all obligations which were originally assumed by the Water Company." The Water Company concurs in the request. The evidence discloses that in order to undertake to do this it will be necessary for them to resort to the Chattahoochee River as a permanent source of supply. A careful reading of the contract will disclose that it was never the intention of the parties that the river should be used as a source of supply. White was to select the source for a gravity system and guaranteed an abundant supply of wholesome water. The scheme of a gravity system is preserved throughout the entire contract. I construe Section XLV to mean that if the gravity system, contemplated at the time the contract was executed, was found impracticable a second reservoir was contemplated as a distributing reservoir, which it was provided, was to be higher than the first, the pressure to be from the force of gravity. Section XLVIII provides for the substitution of the Holly or pumping system under a certain contingency. This provision evidently was intended to apply to what might be found impracticable at the time the source of supply was selected, but whether so intended or not, I think it can safely be concluded that neither of the contracting parties, either in the beginning, or at the date of the supplemental contract, contemplated the Chattahoochee River as a source of water supply. The proposed improvement of the system contemplates abolition of a gravity system and the substitution of pumps with the river as a source of supply. It was contended by Counsel for the defendant that the contract was to be construed to limiting the grantee
211 to the source of supply selected and by the system adoped. Whether or not the contract is to be construed as limited to this particular source of supply, it is very evident that it was never in the minds of the contracting parties that the river should be adopted or ever used as a source of supply. If this must be done the responsibility of adopting this source, which is at least a doubtful expediency, should rest on the City, and not be assumed by the bondholders under permission of the Court. The Court will not undertake to make a new contract between the parties or the creditors of either.

What are the rights of the bondholders in the present case? This is fully stated in the rulings of the Court in the case of the Farmers' Loan & Trust Company, Trustee, *et al.*, *vs.* The City of Galesburg, 133 U. S., 156 L. Ed. 33, 573. In the numerous cases referring to litigation growing out of water works contract, this Galesburg case stands very similar, both in facts and in the relations of the parties litigant, to the case at bar. The litigation was at first begun by the City praying a re-cission of its contract with the Water Company,

and the Trustee intervened for the protection of the bondholders of the Company. The contract, which was with one Shelton originally, was almost in exact terms similar to the contract under consideration, and the facts developed a striking similarity with the facts in the present case, as to the assignment of the contract, the issue and purchase of the bonds, the acceptance of the works by the City, the failure to perform on the part of the Company, and in almost every other particular, and the questions raised by the pleadings are strikingly similar. For the sake of brevity I
212 quote the headnotes of the decision, as bearing upon the interests of the bondholders:

3. "The danger to the health and lives of the inhabitants of the City from impure water, and the continued exposure of the property in the City to the destruction by fire from an inadequate supply of water were public questions peculiarly under the care of the municipality, and it was entitled and bound to act with the highest regard for the public interests, and at the same time with due consideration for the rights of the other parties to the contract."

6. "Although the purchasers of the bonds of the Water Company were influenced to purchase them by the resolution of the City to accept the water works, and by letters from officers and citizens of the City, yet the City was not thereby estopped from refusing to pay rental for the hydrants which, by the terms of the mortgage given by the Company to secure the bondholders, was to be applied to pay interest on the bonds, nor from having the contract canceled."

8. "The obligation of the Company being a continuing obligation, the liability of the City to pay in future the hydrant rents, depended, to the knowledge of the bondholders, upon the future compliance of the Water Company with its contract; and in case of its failure the City would have the right to ask for the re-cission of the contract."

10. "The City's resolution of acceptance of the works is not a guaranty to the bondholders that the Water Company would thereafter perform its contract for furnishing water in the quantity and of the quality called for by the ordinance."

In this Galesburg case the Court holds that the rights of the bondholders are no higher than those of the Company, and that although the purchasers of the bonds (page 581 of L. Ed.) may have been influenced to purchase them by the terms of the resolution of the City accepting the works, and by representations of the officers of the City, the City was not estopped from with-
213 holding hydrant rentals; and further, that although the bondholders exercised good faith in purchasing the bonds, they bought them knowing that the City was not a party to them, and that the payment of water rents depended upon the compliance by the Company with the contract; that the bondholders were bound to take notice of the terms of the contract before purchasing the bonds, and they purchased and held them subject to the continuing compliance of the Water Company with the terms of the

contract; and that their equity, if any, should in no way interfere with the right to the City to have a re-cission of the contract. The force of the applicability of these rulings to the case at bar is so apparent the comparison needs no enlargement.

I conclude:

1. That the holders of the bonds of the Columbus Water Works Company have no greater legal right than the Company to a continuance of the present contract, and the Company having failed to perform its conditions, and the City being entitled to a cancellation thereof as against the Company, it has a similar right against the bondholders who have no legal right to a continuance of the contract for their benefit.

2. That the City of Columbus is entitled to have said contract rescinded, and declared set aside and annulled, and that it should be permitted to carry out the purposes of the ordinance of September 14, 1902 for the construction and operation of a system of water works.

3. That the Water Company is not entitled to the enforcement of the specific performance of its contract, nor of the validation thereof, nor to an injunction against the City's carrying out the purposes of its ordinance.

214 XII.

So much stress has been laid in the argument on the case at bar of its similarity with the cases of Walla Walla *vs.* The Walla Walla Water Co., and the Columbia Avenue Deposit & Trust Co. *vs.* City of Dawson, both of which have been heretofore repeatedly cited, I deem it proper to distinguish those cases from the instant case. In the Walla Walla case the facts were:

1. The contract provided that it should be voidable by the City upon the judgment of a Court of competent jurisdiction, and it was held that the City was bound to obtain this judgment before attempting to avoid the contract.

2. It appears from the statement by the Court that the Water Company had substantially complied with the contract.

3. There was no real contention that the Water Company had failed to comply with its contract, or that any reason existed for the exercise of the police power.

In the Dawson case it appears—

1. The acceptance of the system was not based on any condition or assurances.

2. It was found that the system had been constructed and operated as required by the contract.

3. The service had been accepted as satisfactory and without complaint or suggestion or any defect or inefficiency until the contract had been repudiated, and suit had been instituted by the Water Company.

4. In repudiating the contract the City did not base its
215 claim on inadequacy of supply, inefficiency of service, or bad quality of the water, but it was found that repudiation was found on the technical grounds that a preceding administration

could not bind the city to the contract; that the contract created an indebtedness forbidden by the Constitution of the State, and that the contract was unfair and exorbitant.

5. The Company promptly remedied defects in pressure.

6. The City selected the source of supply, and the quality of the water was such as required by the contract.

7. While taking all benefits of the contract after repudiation, the City refused to pay for water used. Bonds were issued with the consent of the City, and the City agreed to pay the water rentals to the trustee for the bondholders as alternate trustee.

There is no analogy in the case at bar and the foregoing cases on the points as I have stated them. It was contended that the City of Columbus by the resolution of October, 1894, repudiated the present contract. But voters refused to ratify this, and that resolution in effect was only a protest. Subsequently the Water Company and the City recognized the existing contract by supplementing it with an agreement as to the annex, and the Water Company was again given an opportunity to test its ability to carry out the contract.

216 *Summary of Conclusions of Law.*

1. I have concluded that the City had the power to enter into the contract, provided no State or Federal law was violated.

2. That the contract did not create a debt in violation of the Constitution of Georgia.

3. That Paragraph XI is neither a guaranty of payment by the City nor an element of credit.

4. That the grant of the franchise is to be construed as meaning that the City would not enter into competition with the Water Company as long as the contract for supplying water to the City could be complied with on the part of the Company, and that the grant was permissible as an incident to the performance of the principal undertaking.

5. That the Act of 1902 is not a revocation of the franchise as defined in this contract.

6. That the City in the exercise of its police power could enact the ordinance now sought to be set aside, but with limitation as to the rights of the Water Company and its creditors as may be determined by the Court.

7. That the acceptance of the works was conditional, and the Company not having fulfilled its assurances of complying with the contract, and that without fault on the part of the City, the latter is not estopped from constructing a sysem of its own.

8. That City is released of its reciprocal obligations by reason of the continued default of the Company.

9. That City could not in its execution of the contract in
217 1881 bind future administrations to purchase. The clause is to be construed as conferring a privilege of purchase and nothing more.

10. That the valuation of the system should be fixed at cost of re-

production and ten per cent. added for present connections with and supply of buildings.

11. That the contract with the City should be rescinded and injunction denied, and that the bondholders are not entitled to continue operating the works under the contract.

12. I have endeavored to distinguish from the present case the two cases of Walla Walla *vs.* Walla Walla Water Co., and Trust Co. *vs.* City of Dawson, relied upon by complainant as controlling the issues of law in this case.

Recommendations.

Reviewing the several findings of fact, and conclusions of law and fact as applicable to this case on its merits I have to submit, in conclusion, the following:

The case is before the Court under proceedings brought about by the Trustee moving against the Columbus Water Works Company in the interest of the holders of bonds of the Company. Both the plaintiff and the defendant in the foreclosure proceedings are parties to the present bill. The City, as defendant herein, is applying through a cross bill for affirmative relief. The Court is in control of and operating the property. Connected with the legal questions involved is the grave question of supplying the population of a large and rapidly growing city with wholesome and abundant water for do-
218 mestic and sanitary uses and for protection of property. "The consideration of public interest will largely influence a court of equity when property upon which an entire city is dependent for its water comes into the power and under the control of the court." Joy *et al. vs.* City St. Louis, 138 U. S. 1, 34 L. Ed. 843. On the other hand the bondholders, the real parties at interest as to the disposition of the property in litigation, have supplied all the funds both for the original purchase and enlargement of the works, to the extent they have been enlarged. It is true they assumed the risk of the investment, and their legal rights are no higher than those of the Water Company, but there may be an equity in their favor. There are portions of the system, lying within the City of Columbus, which could possibly be made available for the future uses of the City from whatever source her water supply is drawn. While the City is entitled to a re-cission of the contract and may proceed to construct her own water system, such a system operated independent of that of the Water Company would without doubt greatly destroy, if not render entirely valueless, the property to which these bondholders now look for the security of their bonds. Would it not be in accordance with equity and good conscience to require the City, in view of all the facts developed in this case, to utilize this available portion of the system at its reasonable and fair value and the proceeds be appropriated for the benefit of the holders of the bonds? The Court having jurisdiction and having the power to do, under the present bill, whatever may be necessary or proper to fully protect the rights of all and do equity between the parties, can mould a decree
219 which will work no injustice. Whatever be the value of the present water works property, any portion of it which can be

of use to the City in the construction and operation of future water works should be made available for that purpose, and the net proceeds thereof should in equity be applied for relief to that extent of the holders of the bonds of the Water Company. It would be manifestly unjust and inequitable to allow the City to proceed unconditionally with its plan to provide the inhabitants with water and not protect the interests of these bondholders to the extent, at least, of the value of such portions of the system as may be available for the City's use. To quote the language of one of the able counsel for the complainant: "They (the bondholders) are entitled to be protected to the extent of the value that is there." While he referred to the value of the entire system, the statement is equally applicable to the portion which may be available for the City's uses. The bondholders have proposed to sell the present system to the City at a fair valuation. The City contracted for the privilege of purchasing the system, and while I have found this not to be a binding legal obligation of purchase it may in equity be enforced to the extent of requiring a purchase of such part of the system as the City may now use. I have found that the portions lying in the State of Alabama are of no practical value. The valuation I have found is applicable only in case the river is to be used as a source of supply, and I have found that this was not in the minds of the parties when the contract was entered into.

A decree in this cause refusing injunction and declaring the contract annulled and cancelled should not be unconditional. The available property need not be necessarily lost to the bondholders if they be willing to save it upon the terms decreed by the Court. They could be permitted to accept from the City a fair valuation thereof and the City could be required to pay the same before proceeding to carry out the purposes of its ordinance. If, on the opportunity being afforded, the complainant, trustee for the bondholders, declines to accept the valuation fixed by the Court and convey to the City the available part of the system, then the City should be permitted unconditionally to proceed with its undertaking.

I therefore recommend:—

1. That in order to ascertain what may be the value of the portion of the system located in the State of Georgia, so far as the same can be utilized by the City to supply such a distribution system as would be adequate for the needs and purposes of the City in the construction and operation of a water works system, a special reference be had to take testimony of experts upon this question and that a report be had thereon.

2. That on such report being made the City be required, in terms of a conditional decree, to pay into Court for the use of the Trustee, complainant in this cause (subject to prior payments as may be decreed) the sum ascertained by said report, said payment to be made within a day specified after the filing of written consent on the part of the Trustee for the bondholders to accept said amount in satisfaction of all interest and claim of right which said bondholders

allege as existing under the outstanding bonds of the Company or otherwise.

3. That thereupon the lien attaching by virtue of the trust deed, or otherwise, held by the complainant to secure the bonds of
221 the Water Company, so far as the same applies to the property of the Company within the corporate limits of the City of Columbus, Muscogee County, State of Georgia, and found under said refernce to be of use to the City, be released and cancelled, and that the Columbus Water Works Company, and the Mercantile Trust & Deposit Company of Baltimore, execute and deliver to the City of Columbus a conveyance of all of said property, free from all liens and encumbrances under said trust deed and mortgage, and that the Trustee be required to so enter upon said deed, and upon the several bonds on deposit with it and those held for the committee of bondholders in this cause, and that the holders of such bonds as have not been so deposited or held shall be estopped from setting up any claim or lien upon the property so conveyed, and further that the eight bonds held by the Receiver be surrendered and cancelled, and Receiver's certificates be substituted therefor as collateral for the outstanding indebtedness secured by said bonds.

4. That out of the funds decreed to be paid into Court there shall first be paid any sums necessary for redemption of all outstanding certificates of the Receiver, and such other sums as may be proper to be paid after an accounting has been had of the indebtedness of the Receiver, and that the property above named be declared free of all lien of Receiver's certificates and all other liens.

5. That the affirmative relief as prayed for in the cross bill of the City be granted, and that the City be allowed, after the deposit of the aforesaid amount, to proceed to carry out the purposes of the ordinance providing for its water works system.

222 6. That the indebtedness of the City to the Water Company of $2530.82 withheld for water rentals due October 1st, 1902, be reduced by one-third, inasmuch as the City received no benefit of the water for domestic purposes during that period, and that the City be required to pay the balance to the Receiver.

7. That the cost of the litigation be taxed equally between the parties.

8. That in event the City fail to pay in the amount on the day specified as provided in the second paragraph herein, when written acceptance is filed by the Trustee as required, then injunction issue against the City and the bondholders be permitted to carry out the contract as prayed in their amendment to the bill, and all costs be taxed against the City; but in event the acceptance of the Trustee is not filed, as required, then the bill of complainant be dismissed and the City be permitted to proceed to carry out the purposes of its ordinance of September, 1902, and all costs be taxed against the complainant.

Dated and signed this November 19th, 1904.

Respectfully submitted,

HENRY R. GOETCHIUS,
Master in Chancery.

Memoranda.

On October 15th, 1904, draft of my report was served on Counsel for each of the parties, and written notice was given, assigning October 24th thereafter as the date on which exceptions and suggestions of amendment should be filed with the Master. On said last named date Counsel filed with the Master a stipulation in writing that objections or exceptions to said draft of report in behalf of either
223 party might be filed on November 7th following and argument had thereon at that time, and it was also stipulated that all exceptions and objections to the Master's report, when filed, should be made and filed by twelve o'clock noon on the first Monday in December, 1904, so that the hearing on said report and exceptions thereto should be in order at the ensuing term of the Court, Counsel in said stipulation waiving the one month allowed under the rule for filing exceptions to said final report when filed, and reserving the right of exception to the rulings of the Master on their exceptions and objections to be filed November 7th, 1904. On said last named date counsel for complain-t filed with me eighty-eight (88) exceptions and objections, and counsel for the defendant, the City of Columbus, on the same day, likewise filed twelve (12) exceptions and objections to the draft report. Argument was on that day had thereon. After due consideration, the Master has allowed some of the exceptions on either side and corrected the report in conformity therewith, and has disallowed and overruled other exceptions on each side, as will appear from his rulings hereinafter set out. The Master files with this, his report, the following books, papers and documents introduced as evidence before him on the hearing, all of which (except the pleadings in the cause) have been properly identified by his official signature and constitute the record of the cause before the Master, to-wit:

1. A volume designated Volume Number 1—consisting of 540 pages of typewritten and printed matter, including a portion of the pleadings and exhibits thereto; also photographs, tabulated
224 statements, pressure records and what is known as "Hall's Report," etc.; all of which, by agreement of counsel, were by the stenographer placed in this form, the originals being identified and duly of file in this record.

2. A stenographic report of the oral testimony and proceedings, contained in three bound volumes numbered 2, 3 and 4, and having 1,295 typewritten pages.

3. A map of so much of the City of Columbus as is covered by the system of the Columbus Water Works, which map shows the extent and character of the system as it was at the date of the hearing; attached to said map is an exhibit by the Receiver showing the mileage of mains and other data reduced to figures.

4. A specimen of the piping taken from the mains November 19th, 1903.

5. A stenographic report of the testimony taken before his honor, Judge William T. Newman, June 25th, 1904, in the hearing on the petition to dissolve the injunction *pendente lite*, consisting of 25 pages of typewritten matter. Also, in connection therewith, the report of

the Receiver as to condition of drainage at Columbus June 25th, 1904, also submitted in evidence at said hearing and duly of file herewith.

6. Certified copy of petition and order of renewal of charter of Columbus Water Works Company.

7. Affidavit of W. S. Greene, Receiver, and exhibits permitted to be filed August 10th, 1904, showing facts as to analyses.

8. Stipulation in writing by Counsel on both sides, of date October 24th, 1904, and relating to exceptions before the Master.

225 9. Exceptions and objections to draft of report by Counsel for both complainant and defendant, together with my rulings thereon.

10. Pleadings and record in the cause and also in the foreclosure proceedings now pending in this Court with reference to the property involved in this litigation.

Dated and signed this November 19th, 1904.

Respectfully submitted.

HENRY R. GOETCHIUS,
Master in Chancery.

Rulings of the Master on Exceptions to Draft Report.

I.

On the exceptions, objections and suggestions of the complainant, filed November 7th, 1904, to draft of my report, after argument and due consideration I rule as follows:

Exceptions 1, 2, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 28½, 29, 30, 32, 33, 34, 35, 36, 37, 38, 40, 41, 42, 43, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 55½, 56, 58, 59, 60, 61, 62, 63, 64, 65. (No such language as is excepted to in 65 appears on page 134 of the draft report.) 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82 and 83 are overruled.

Exception 3 is allowed in part and corrections made accordingly.

Exception 14 is allowed in part by change of year 1890 to 1893, and corrections made accordingly.

Exception 14½ is allowed, and the language excepted to is stricken.

226 Exception 15 is allowed and proper correction made, incorporating the suggested amendment.

Exception 16 is overruled for the reason that a sworn statement of the Receiver, identifying the several analyses referred to in this exception, was, under a ruling made at the conclusion of the hearing July 11th, 1904, permitted to be filed August 10th, 1904. The substance of this statement, explaining the analyses referred in the exception, has been fully set out in the report. The two affidavits sought to be brought in by this suggestion of amendment were, when presented, promptly returned by the Master to counsel for the complainant as the case had been closed—counsel on both sides having been notified at the conclusion of the hearing that no other evidence

would be permitted filed except the sworn statement of the Receiver of August 10th, as above referred to.

Exception 31 is overruled, but in so doing I have amended a portion of this 18th paragraph of the draft report. The change in no way affects the conclusion as stated in the draft report, which statement of conclusion is left as originally drafted.

Exception 39 is overruled generally, but allowed to extent of changing the year 1890 to 1893.

Exception 44 is overruled with same explanatory note as made on ruling in exception 31.

Exception 57 is overruled in part and allowed to extent of correcting report as to time of discontinuance of laying 4-inch mains; also by inserting after the figures expressing value the words, "with the river as a source of supply;" also by inserting a reference specially to Alabama property. In these respects my report is corrected accordingly.

227 Exception 66 is allowed and the language is stricken.

Exceptions 67 to 70, inclusive, are allowed in part and my report corrected accordingly.

Exceptions 84 and 85 are allowed to extent of striking Paragraph 1 of draft report and substituting for the general recommendations of the draft report others as set out in my report, in which substitute a special reference as to values is suggested. Except in the allowance of this amendment these two exceptions are overruled.

II.

On the exceptions, objections and suggestions of the defendant, the City of Columbus, filed November 7th, 1904, to draft of my report, after argument and due consideration I rule as follows:

Exception 1 is in part allowed and report corrected by substitution but not omission as suggested.

Exceptions 2, 3, 5, 6, 7 and 7 (*a*) are overruled.

Exception 4 is overruled, but I have in part changed the language of Paragraph 18 of the draft report, but not to affect the conclusion.

Exception 8 is overruled except to extent of modifying the language of the report referring to meaning of rulings of the Court applied to this case. My report in this respect is amended.

Exception 9 is overruled, but I have amended the draft report by inserting after the figures expressing value the words "with the river as a source of supply."

Exception 10 is overruled to extent of refusing to strike all recommendations, but the general recommendations herein excepted

228 to have been stricken and other general recommendations substituted in part embracing these exceptions to and in part correcting them.

Exception 11 is overruled, but the explanatory note made by me in ruling on exception 10 likewise herewith applies.

Dated and signed this November 19th, 1904.

Respectfully submitted,

HENRY R. GOETCHIUS,
Master in Chancery.

229 In the Fifth Circuit Court of the United States for the Western Division of the Northern District of Georgia.

MERCANTILE TRUST & DEPOSIT COMPANY OF BALTIMORE, Trustee,
vs.
THE CITY OF COLUMBUS, COLUMBUS WATER WORKS COMPANY, L. H. CHAPPELL, as Mayor, and E. P. DISMUKES ET AL., as Aldermen.

Bill in Equity.

THE CITY OF COLUMBUS
vs.
MERCANTILE TRUST & DEPOSIT COMPANY OF BALTIMORE, Trustee; COLUMBUS WATER WORKS COMPANY, and WILLIAM S. GREENE, Receiver.

Cross Bill.

Exceptions taken by the Mercantile Trust & Deposit Company of Baltimore, the complainant in original bill above named, and one of the defendants in cross bill above named, to the report of Henry R. Goetchius, Esq., Master in Chancery.

Joseph Packard, Hall & Wimberly, Louis F. Garrard, Solicitors for Mercantile Trust & Deposit Co., of Baltimore, Trustee.

230 In the Fifth Circuit Court of the United States for the Western Division of the Northern District of Georgia.

MERCANTILE TRUST & DEPOSIT COMPANY OF BALTIMORE, Trustee,
vs.
THE CITY OF COLUMBUS, COLUMBUS WATER WORKS COMPANY, L. H. CHAPPELL, as Mayor, and E. P. DISMUKES ET AL., as Aldermen.

Bill in Equity.

THE CITY OF COLUMBUS
vs.
MERCANTILE TRUST & DEPOSIT COMPANY OF BALTIMORE, Trustee; COLUMBUS WATER WORKS COMPANY, and WILLIAM S. GREENE, Receiver.

Cross Bill.

Exceptions taken by the Mercantile Trust & Deposit Company of Baltimore, the complainant in said original bill above named, and one of the defendants in said cross bill above named, to the report of Henry R. Goetchius, Esq., Master in Chancery, to whom the said causes stand referred under and in pursuance of the decree or order of reference made in said first mentioned cause on the 19th day of November, 1903, and the order of reference of the matters embraced in said cross bill made on the 8th day of December, 1903.

231 Comes now the said Mercantile Trust & Deposit Company of Baltimore, the above named complainant in the above

named bill of complaint, and one of the defendants in said cross bill above named, and *excepts* to the report and to the findings of fact and conclusions of law filed herein by Henry R. Goetchius, Esq., standing Master in Chancery for the Western Division of the Northern District of Georgia, to whom the said bill and cross bill were referred for full investigation and report upon all the questions of law and fact involved therein, in the following particulars and on the following grounds, to-wit:

First Exception.

The said Mercantile Trust & Deposit Company of Baltimore, complainant in the original bill and respondent in the cross bill above named, and for the sake of brevity and convenience styling itself hereinafter the "complainant," by which term is meant to be designated each time the said Mercantile Trust & Deposit Company of Baltimore, complainant in the original bill, and defendant in said cross bill, excepts to the finding of fact of said Master touching the acceptance of the water works by said City of Columbus at the meeting of the City Council on November 6, 1882, which is on page 24 of the printed report, and in the following language, to-wit:

"I find that this acceptance was based on the statement of the Water Company that the system had been completed in compliance with the contract, and upon the assurances by the Company that the water would be wholesome, abundant and lasting."

232 Complainant submits that the finding that this acceptance was based on the statement of the Water Company that the system had been completed in compliance with the contract, is erroneous for the reason that there is no evidence whatever in the record that the acceptance of the completed system of water works by the Mayor and Council of the City of Columbus was based upon the statement contained in the communication of October 31, 1882, from the President of the Water Works Company that the system had been completed in compliance with the contract. No witness testified that the Mayor and City Council acted upon the statement contained in said communication; the resolution contains no recitals, and shows no fact from which such an inference could be drawn. On the contrary, as complainant submits, it was shown by the undisputed evidence that the City was represented by a special committee, made up in part of experts, to-wit: John Hill and W. R. Brown, one of them John Hill, an hydraulic and mechanical engineer of eminent ability and known skill, thoroughly competent to determine all the questions of hydraulics and water works construction. The contract contains minute and carefully drawn specifications setting forth minutely and particularly dimensions, height, capacity of the storage reservoir, size of pipes and total quantity of pipe to be used, method of constructing reservoir, and other specific requirements, all of which could be and must have been seen and passed upon by the City and its special committee under whose direct personal supervision said system of water works was constructed and built, and the City Council

233 in accepting the system acted upon its own independent investigations, and upon matters resting as fully within its

knowledge as within the knowledge of the Company, and upon the report of its aforesaid special committee, based upon the investigations of its aforesaid experts. And in support of this exception, complainant, in addition to the undisputed testimony as to the skill and eminent ability of the said John Hill, cites and calls the attention of the Court to the provisions contained in said water works contract, and in particular the following sections thereof:

Section 3, prescribing the size and elevation of the storage reservoir.

Section 4, prescribing that the supply main should be of 12 inches internal diameter, and supply the street mains at the pressure due to elevation.

Section 5, that the distribution system was to consist in the beginning of five miles of street mains of 12, 10, 8, 6 and 4 inches internal diameter, to be laid "with the consent of a special committee appointed by the City Council." And that the street mains should be of the best cast iron, coated with coal tar, offering and capable of standing a hydrostatic pressure of 300 pounds to the square inch.

Section 6, prescribing the number and distribution of stop vales.

Section 7, prescribing the number and kind of hydrants, and the dimensions and construction of the hydrant connections.

Section 9, providing that the sizes of the various mains in the streets are "to equal the sizes given in the plans for pipes sub-
234 mitted to the special committee of Council previous to the execution of this contract."

Section 23, prescribing the depth at which mains and pipes should be placed beneath the surface, and provisions for the protection of the valves and hydrants from freezing, etc.

Section 24, as to the size, style and construction of the hydrants, valves and attachments, including openings, threads to fit couplings, direction of opening, method of closing, and other minute and detailed description, as well as other detailed and minute specifications under which it appears that said system was constructed under the direct supervision of the special committee representing the City, including the aforesaid skilled and thoroughly competent hydraulic and mechanical engineer acting for the City in that behalf.

(See Water Works Contract, and particularly the sections above mentioned, in Volume 1 of the report of evidence accompanying the Master's Report, pages 222, 223, 224, 225, 226, 231 and 234.)

And in further support of this exception complainant cites the Court to the resolution of the City Council of March 12, 1881, selecting the said John Hill and W. R. Brown to officiate as a committee of conference in concert with the Mayor and committee of Council, in respect to the proposed erection and operation of water works. (Vol. 1, p. 280.)

The resolution adding to Council's committee the said W. Riley Brown and John Hill, to determine what plan or system the City would adopt in the erection of water works, at the meeting of
235 Council of March 2, 1881, before the present contract was made or even thought of. (Vol. 1, page 282.)

The proceedings of Council of September 20, 1881, in which, by resolution, the said W. Riley Brown and John Hill were selected to

act in concert with three members of Council as a committee to enter into correspondence with some responsible party to build water works for said city. (Vol. 1, page 283.)

The proceedings of Council of April 5, 1882, in which the City of Columbus adopted the report of its said committee, upon which were the said John Hill and W. R. Brown, accepting the Columbus Water Works Company, transferee of the present water works contract from Thomas R. White, and ratified and assented to said transfer, and recognized the said Columbus Water Works Company as assuming the obligations and entitled to the rights, privileges, and emoluments arising under said contract; and also containing certain provisions as to how the pipes should be laid, and reciting that the plan for laying pipes and plan for crossing the bridge were retained by it. (Vol. 1, pages 285, 286 and 287.)

The complainant cites in further support of this exception, the resolution of Council accepting the said system of water works mentioned and referred to in the report of said Master on pages 23 and 24 thereof, and upon which his aforesaid finding, now excepted to, is based. And particularly to the fact that said resolution accepting said water works as having been completed by the Columbus Water Works Company in accordance with the contract, was introduced by said Water Works Committee, and was signed by said com-
236 mittee, including the aforesaid John Hill, hydraulic, mechanical and consulting engineer above mentioned, selected by the City for the purpose, and the said W. R. Brown, the other expert, selected by said City and made a member of said committee. And the language that the City was "satisfied that the water works and the supply of water for the City and the citizens of Columbus has been completed by the Water Works Company in accordance with the contract made between the said Mayor and Council and Thomas R. White, etc." is the language used by said committee, upon which were the aforesaid experts. (Vol. 1, pages 289, 290.)

Wherefore complainant submits that the finding that said acceptance was based on the statement of the Water Company that the system had been completed in compliance with the contract is without evidence, and contrary to the plain and uncontradicted evidence in said case, from which it appears that said water works was constructed according to plans and specifications prepared by the City with the assistance of an hydraulic engineer employed by said City for the purpose, and were constructed under the immediate supervision of said committee, including the said hydraulic engineer, and that said acceptance was with a full knowledge of all the facts.

And complainant further submits in support of this exception, that it appears further from the uncontradicted testimony that from the time that said works were accepted in November, 1882, up until after the City repudiated its contract in September, 1894, upon the ground that the contract was illegal and invalid because not
237 submitted to popular vote, the City at no time ever made any contention that said water works system in any particular was constructed in any respect different from the requirements of the contract; and the City never contended that it was misled by any

statement or statements of the President of the Water Works Company at the time said acceptance was made.

And complainant further submits, as a part of this exceptions, that there is no evidence upon which to base said finding of the Master that said acceptance was based "upon the assurances by the Company that the water would be wholesome, abundant and lasting."

On the contrary, complainant says that the requirements as to the wholesomeness, abundance, and permanence of the water supply are matters dealt with and which are to be determined by the language and provisions of the contract itself. The said contract containing provisions which deal with the subject of wholesomeness and quantity of water, and the manner of determining whether the water at any time might be wholesome, and the question of sufficiency of quantity, failure of supply, diminution or unwholesomeness of the water, and sufficiency of pressure are matters which are to be determined in the manner, and only in the manner, provided by the contract itself; that the communication from the President of the Water Works Company, calling upon the City Council for its acceptance of the works, adds nothing to the obligations contained in the contract itself, and does not have the effect, and was not intended by the Water Works Company, or understood by the City, to have the effect of relieving the City from any of its cross obliga-
238 tions or duty it was under of proceeding in accordance with the contract to determine whether at any time the water furnished was "wholesome, abundant, and lasting."

And in support of this exception complainant cites the Court to the provisions contained in the contract as to how the said several matters should be ascertained and dealt with, and fixing and defining the obligations of the Water Company with respect to the wholesomeness, abundance, and permanence of the water supplied to the City and its inhabitants. And in particular Section 13 of the contract, (Vol. 1, page 226), which provides that the question whether the water had become contaminated or unwholesome from any cause should be determined in the manner therein provided; said section requiring that the proper City authorities should give notice of the alleged fact of contamination or unwholesomeness of the water, that a reasonable time after such notice should be allowed the said Thomas R. White for improving the quality of the water, that after such reasonable time the question of the wholesomeness of the water should be determined by three scientific experts, one to be selected by the said Thomas R. White, one to be selected by the City, and the two to select a third. (Vol. 1, page 226).

The said contract containing also explicit provisions to determine the question of sufficiency of water in quantity and pressure. Complainant cites in particular Section 27, providing that whenever the increased consumption of water should be such as to reduce the pressure below the contract requirement of 32 pounds to the square inch in any portion of the City, that that portion of the system
239 should then be deemed of insufficient capacity and be replaced. (Vol. 1, page 233).

Complainant cites also Section 22, fixing the penalty for the interruption or failure of the supply. (Vol. 1, pages 230, 231).

Wherefore, complainant submits that the finding that said system was accepted "upon the assurance by the Company that the water would be wholesome, abundant, and lasting," is erroneous and without any evidence whatever to support it, and contrary to the facts appearing in the contract itself.

Second Exception.

Complainant excepts to the finding of fact on page 46 of the printed report of said Master, which is as follows, to-wit:

"I find that from 1889 to May, 1900, except at comparatively short intervals, there was dissatisfaction and complaint on the part of the City because of the insufficiency of the water supply, and especially with the unsupplied needs of the City for water in its annexed territory; that the Company had notice of this, and recognized the necessity of increased supply."

Complainant submits that said finding is contrary to the evidence, and is not in accordance with the facts as established by the evidence had and taken in said cause and sent up by the Master, but is erroneous in the following particulars, and for the following, among other reasons, to-wit:

From the time the works were completed and accepted, on November 1, 1882, up to the year 1889 inclusive, there have never
240 been any complaints, until September 1, 1886. At the next meeting of Council, to-wit: on October 6, 1886, the committee reported that it had had a conference with the President of the Water Works Company, who had undertaken to correct the faults complained of. (Vol. 1, p. 382.)

Subsequently, in 1887, the committee called upon the city attorney for his opinion as to the proper method in which to proceed. The city attorney gave his opinion as to the method to be pursued, and the complaints were removed to the satisfaction of the city. (Vol. 1, Pages 383, 387, 306, 307.)

On June 6, 1888, the Committee on Water Works stated that the differences with the Water Works Company had been arranged, and that it had approved the bills of the Company for the preceding five quarters and asked that their action be ratified, which was done. (Vol. 1, page 306.)

In their report for the year 1888, made to Council December 10, 1888, the Committee on Water Works say: "Your Committee on Water Works are pleased to report a very marked improvement in the water service furnished to you during the past year by the Columbus Water Works Company, who have shown a disposition to meet and remedy all reasonable complaints of our citizens." And in the same report the committee referred to the costly standpipe recently erected, and to other improvements. (Vol. 1, pages 306, 307.)

In their report for the year 1889, the committee used substantially the same language, and spoke in the highest terms
241 of the character of the service furnished. (Vol. 1, page 307.)

From this time until a period is reached subsequent to the City's repudiation of its contract upon the ground that the same was invalid, as not having been authorized by popular vote, no complaints as to the insufficiency of the water supply are to be met with, or any other complaint, except that on one occasion, to-wit: February 5, 1890, it is stated in Council meeting that the pressure upon test had been found insufficient, and that one of the directors had promised to better the service. (Vol. 1, page 389.)

In 1891 George J. Burrus, Chief Engineer of the Fire Department, in his annual report, says: "The pressure at all times has been up to the standard, and the supply ample." (Vol. 1, page 298.)

In 1892 he reports: "The pressure has at all times been up to the required standard, as the register in my office will show." (Vol. 1, page 299.)

In 1893 he reports: "There has been no scarcity of water where the mains reach at any time, and the pressure, according to the *guage* in my charge, with very few exceptions, has been up to the required standard." (Vol. 1, page 299.)

In 1894 he reports: "The pressure, according to the *guage* in my charge, shows an average pressure of 40 pounds." (Vol. 1, page 299.)

In 1895, he reports: "During the protracted drought of the last few months the *guage* in my charge has averaged 40 pounds." (Vol. 1, page 300.)

In 1896 he reports: "The pressure on the mains is, as
242 before stated in previous reports, an average of 40 pounds per square inch." (Vol. 1, page 300.)

In 1897 he reports: "The Columbus Water Works Company continue to furnish water at an average pressure of 40 pounds." (Vol. 1, page 301.)

In 1898 he reports: "The pressure remains the same as in former reports." (Vol. 1, page 301.)

In 1899 (being the time of the transition from the old gravity system to the new pumping system) he reports that the pressure at times had been lower than for previous years. (Vol. 1, page 202.)

During the same year, 1899, Lucius H. Chappell, Mayor, reports that the Columbus Water Works Company have supplied the City with good and wholesome water during the past year, and in ample quantities for all practical purposes. (Vol 1, page 303.)

For the next year, however, the report of I. F. Pearce, Chief Engineer of the Fire Department, who had succeeded Burrus, shows effective pressure and satisfactory service.

During the same year, 1900, Hon. Lucius H. Chappell, Mayor, reports: "The Columbus Water Works Company have furnished to the City throughout the year pure, wholesome water in ample quantity." (Vol. 1, page 302.)

No complaints thereon, as above set forth, are to be found as to the sufficiency of the water supply, or of the pressure, or for any

other cause, between 1889, the first year mentioned in said finding and a period subsequent to the repudiation by the City of its con-
tract. No witness who has testified in the case has specified any occasion upon which there was ever an insufficiency of wate
243 supply until subsequent to the City's repudiation of its con-
tract in 1894. No evidence is to be found suggesting any insufficiency of the water supply during 1889, 1890, 1891, 1892 1893, or prior to the repudiation by the City of its contract in 1894 The affidavits of numerous citizens (eighty-two in all), introduced by the defendant, only purport to speak for the greater part of the eight years immediately preceding the date of the affidavit, to-wit September 17, 1903. The first protracted drought, referred to in the affidavits, which threatened temporarily the sufficiency of the water supply, was in 1895, after the City had repudiated its contract and thereby defeated the plans of the Water Company to erect an additional reservoir, for which it had already purchased ground and the springs, and caused plans to be made prior to such repudiation (See statement of amounts expended for betterments of plant o Columbus Water Works Company by years, Vol. 1, page 361, showing the purchase, on December 31, 1891, of 142 acres of land, known as the Stewart Spring property, $1,465.00, for proposed additional reservoir, and December 31, 1902, expenditure for preparing map and survey for Receiver No. 3, $461.30. (See also testimony of H. H. Epping to the same effect.)

Complainant says that said finding is incomplete, erroneous and misleading, for that the facts were, and the Master should have found, that at the time the present issue of bonds were sold at the beginning of 1891, the City was accepting the service rendered as entirely satisfactory; that as appears from the testimony of F. M. Colston, the said Colston came to Columbus about the end of
244 the year 1890, and spent four days there making inquiries meeting and talking with various representatives and prominent citizens, talked to the bank presidents and the Mayor, and many others, and found that there was no complaint whatever, that the service furnished was entirely satisfactory in quantity, quality pressure and every other respect. (Vol. 4, pages 1019, 1020.)

That beginning in 1891, large sums of money were expended by the Water Works Company in enlarging and bettering the system and the betterment of its service, there having been expended by said Company for such betterments between the purchase by the present owners in the early part of 1891 and the repudiation by the City of its contract in 1894, of $43,919.13 for such betterments (Vol. 1, page 361.) That still other improvements had been planned and were actually under construction when stopped by the City's repudiation of the contract on the ground that the contract was invalid because not submitted to popular vote. That from 1889 until a period subsequent to the repudiation of its contract by the City, there had never been any insufficiency of water supply any deficiency of pressure (except the one occasion of alleged deficiency pressure February 5, 1890, above referred to, and which

was promptly remedied); nor any failure to comply with the contract, or any complaint on the part of the City of any alleged failure of the Company to comply with its contract. The complainant submits that it is shown by the uncontradicted evidence that the resolutions which led to the employment of an engineer by the City, were passed upon the City's desire to deal with the question of furnishing a water supply in the newly annexed portion of the City, and
245 that while this question was under consideration, the City, relying upon the decision of the Court then recently rendered, took the ground that the contract with the Water Company was invalid by reason of its not having been submitted to popular vote, and the resolutions for submitting the question to popular vote repudiated and denied the obligation of the contract upon the ground that said contract was illegal by reason of not having been so submitted to popular vote, and were not based upon any contention that the Company had failed to comply with its contract. (See Vol. 1, pages 390 to 417, inclusive.)

The complainant submits further that said finding as to the circumstances is misleading, incomplete and erroneous, in that the undisputed evidence was, and the Master should have so found, that the Water Works Company from the time that the City repudiated the contract up to the end of the period mentioned in the aforesaid findings of fact, at all times used its most earnest endeavors to procure from the City a recognition of the existence and validity of the contract, explaining to the City that the City's action destroyed the ability of the Company to place its bonds to raise means wherewith to make desired extensions; and the Company undertook, and at various times promised and agreed, not only to meet all of the complaints without regard to its obligation so to do under the contract, but in addition to make all extensions, betterments and changes which the City might desire or request, provided only that the City would on its part undertake to be bound by the terms of the contract for the period that the contract ran; that the City at all times declined so to do, and by resolution, and by corporate action
246 planted itself upon the proposition that the contract was not binding, except during the pleasure of the City, and as a contract from year to year, and refused, when requested, to give the Water Works Company its assurance that it would on its part be bound by the contract, although the Water Works Company at the time made known to the City that its course of conduct in repudiating the obligation of the contract destroyed the ability of the Company to place its bonds, and raise money for extending and improving the system.

And in support of this exception complainant cites the Court to the resolutions of Council, reports of special committee; communications between the City and said Company from the time of said repudiation up until April 1, 1896, when the City finally rejected the recommendations of its committee that such assurances be given the Water Company, and finally broke off all further negotiations with said Company. (Vol. 1, pages 424, 425, 426 to 429, 429 to 432, 436, 436 to 439, 439, 440, 440 to 445.)

And complainant further says that said finding is erroneous, incomplete and misleading in that the same does not set forth specifically and in detail the specific complaints which the said Master has in mind, or specific facts upon which he bases the said finding that there was dissatisfaction and complaints on the part of the City because of the insufficiency of the water supply. Complainant submits that said general finding in the nature of a conclusion, without a finding of the specific facts from which the Court may judge as to
the correctness of said conclusion, is erroneous and does a
247 grave injustice to complainant; complainant contending that
said finding is wholly unauthorized, and would so appear to the Court if the facts were specifically stated and found by the Master.

Complainant prays that said finding may be reversed, annulled and set aside, and that the Master be required by the Court to report specifically upon the facts, and that such further action be had as may give to complainant the benefit of the undisputed facts above set forth; and complainant says that said finding that there was dissatisfaction and complaints on the part of the City is erroneous for the reason already stated.

And complainant further says and submits that the finding that the Company had notice of such insufficiency and recognized the necessity of increased supply, is likewise erroneous. Complainant avers the facts to be that without regard to the requirements of the contract, the said Water Works Company was willing to meet all the requirements, demands and wishes of the City of Columbus though far in excess of the requirements of the contract, and that its agreement so to do was not a recognition of any obligation on its part, but rather the result of its desire to fully meet the wishes of the City and remove all possible cause of friction or dissatisfaction.

Complainant says that said finding is erroneous in wholly failing to draw the distinction between the requirements of the contract and those things which the Water Works Company was willing to do in excess of the contract requirements. The demands made by the City subsequent to its repudiation being in excess of the contract requirements and without reference to the contract provisions, and being
accompanied by the demand that the Water Works Company
248 make a new contract, and the Water Works Company was
willing to make a new contract to meet these increased demands. And complainant specifies amongst the many demands of the City in excess of the contract requirements, which the Water Works Company was willing to meet and would have met had the City been willing to recognize some permanent obligation on its part, the following:

The contract required only 32 pounds pressure on the level of the market house; the Water Works Company, to meet the City's increased demands, agreed that it would furnish a pressure of 75 pounds at the market house, and a pressure of 45 pounds in the highest point of the annex for fire protection.

The contract called for a gravity system; the Water Works Company, at a great increase of the original expense, expressed a willing-

ness to change to a pumping system in which the desired pressure should be secured by pumps operated by steam.

And in numerous other particulars the Water Works Company expressed its willingness to accede to the demands and wishes of the City, and did fully accede thereto, subject only to the proviso that the City would recognize the contract as binding and permanent for the length of time covered thereby.

(Vol. 1, pages 424, 425, 429, 432, 436 to 439, 439 to 440, 440 to 445.)

But all of said agreements were not based upon any recognition by the Water Works Company of any obligation of any increased supply under its contract, but on the contrary the said de-
249 mands on the part of the said City of Columbus were always accompanied by the inquiry whether the said Water Works Company would be willing to enter into a new contract containing requirements greatly in excess of those contained in the original contract, and the City and its Water Works Committee recognized that said concessions were all of them largely in excess of the provisions and requirements of the original contract.

Wherefore, complainant says that said finding is erroneous in the particulars and for the reasons above stated and set forth; and complainant prays that the same be corrected and findings be made in accordance herewith.

Third Exception.

Complainant excepts to the finding of fact on pages 49 and 50 of the printed report of the Master, as follows, to-wit:

"I find that the Water Company has at no time complied with Section 3 requiring a reservoir of one hundred and twenty-five million gallons available capacity."

Complainant contends that this finding is erroneous for the following reasons and in the following particulars, namely:

That it appears from the evidence, and should have been so found by the Master, that this departure from the original specifications contained in the contract can not be regarded in any other light than a modification of the original plan assented to by the City by its acceptance of the works as completed, and for many years thereafter; that it appears from internal evidence, furnished
250 by the contract itself, that at the time the contract was made the source of supply had not been selected, and in making the selection other desirable features needed to be considered besides reservoir capacity—in particular, height of head and removal from possible sources of contamination; that while the source selected was such as not to furnish an available reservoir capacity up to the specifications in the contract, yet in other particulars the selection of that source furnished compensating advantages, and in those particulars the system went beyond the requirements of the contract, especially in the matter of height of head, giving a gravity pressure greater than was contracted for.

While it is true that the reservoir capacity of the upper and lower reservoirs amounted only to about fifty-two millions of gallons, yet

as a compensating advantage the site selected gave an elevation of 119 and 132 feet, respectively, for the lower and upper reservoirs, whereas the contract only required an elevation of 100 feet, and thereby the system was enabled to give a gravity pressure considerably greater than was contracted for by reason of this increase of elevation. The City, therefore, in the exercise of its business judgment, doubtless acted wisely in accepting a site which furnished a smaller reservoir capacity than that originally contemplated, in view of the fact that thereby considerable height of head was secured, and therefore considerably greater pressure, due to the increase of height of head, than was contracted for, besides other compensating advantages in the way of a watershed within which few persons dwelt, and which was little liable to danger of contamination. The City accepted the works as a completed system with such modifica-
251 tions in the original plan as were made during the actual construction of the work, a departure from the original plan being compensated by advantages in other directions. The City at the time was represented by its Water Works Committee, upon which was an engineer, who was a recognized leader in his profession in this part of the country. Having accepted the completed system with this departure from the original plan, such acceptance constitutes a modification to that extent of the original specifications, and the City, after such acceptance, was precluded from objecting that the system, as completed, was not a compliance with the contract in a matter as open to observation, and easily capable of being ascertained by measurement as that of reservoir capacity. And particularly is this true after more than twenty years have elapsed, and after bonds have been issued and sold upon the faith of the City's acceptance of the system as actually constructed, including the aforesaid modifications, it appearing that the City never, at any time, until after its repudiation of the contract, made any objection as to the size or capacity of the reservoirs, and such repudiation being wholly disconnected with any alleged defects or deficiencies in the system, being based wholly upon the contention that the contract was illegal because entered into without the formality of a submission to popular vote.

Complainant prays that said finding be modified in accordance with the above suggestions, and that the report set forth the facts above stated in lieu of the above finding.

252 *Fourth Exception.*

Complainant excepts to the finding of fact on page 50 of the printed report, at the conclusion of the sixth paragraph thereof, to the effect that from 1884 the Water Company has failed to comply with the requirements of Section XII of the contract as to the construction and maintenance of reservoirs.

Complainant submits that in lieu of said finding the Master should have found as follows, viz:

The contract only requires a single reservoir (Vol. 1, page 223, Section III of contract). As shown by the evidence only one reser-

Section XXVII of the contract in maintaining a pressure of 32 pounds, nor the supplemental contract requirement of 40 pounds; that in fires of any magnitude the pressure and water supply is insufficient, and that the supply is not ample for fire protection, as required by Section XI."

Complainant excepts to said finding as erroneous and contrary to the evidence; and complainant submits that the first fire of which any complaint is made was the Brewer fire, which occurred in 1893, and as shown by the uncontradicted evidence, the want of pressure at that fire was due to bad management on the part of the Fire Department; and that passing over that fire the only other fires as to which any complaint is made as to the pressure are fires which occurred long subsequent to the City's repudiation of its
282 contract; and complainant submits that, as shown by the annual reports of the Chiefs of the Fire Department, the water supply was ample and the pressure adequate, and that such evidence is wholly uncontradicted by any other evidence until a period of time is reached long subsequent to the City's repudiation of its contract; and that there is no testimony of any failure at any time which ought to be given the effect of conflicting with the evidence furnished by the reports of the Chiefs of the Fire Department year after year, the reports of the Mayor, and the absence of anything in the proceedings of Council militating against the correctness of the various reports.

Complainant further submits that the alleged failure at several fires, of which complaint is made, is shown to be due to an excess rather than to any deficiency of pressure, and that the times when the pressure gauge showed less than 32 pounds pressure were, nearly all of them, during a period when the City had available the pressure due to Rose Hill elevation, which could have been added to the pressure shown by the gauge by the turning of a valve at any time the same might have been needed.

Complainant refers again to the reports of the Chiefs of the Fire Department during each of the years above referred to as showing that the pressure was satisfactory. (Vol. 1, pages 288 to 303, inclusive.) And said official reports, before litigation was contemplated, cannot be overcome by change of opinion on the part of the Chief of the Fire Department making these reports, and on the part of his subordinates after litigation begun.

Complainant submits that the exceedingly small number
283 of destructive fires in a city the size of Columbus, as compared with other cities of the same size, and smaller, bears eloquent testimony to the effectiveness of the water supply for fire purposes.

Sixteenth Exception.

Complainant excepts to the findings of fact of the said Master on pages 69, 70 and 71 of the printed report touching the analysis of June 22, 1904, June 25, 1904, July 12, 1904, and August 8, 1904, which finding- are as follows, to-wit:

"On June 22d, 1904, the State Chemist made chemical analysis of sample taken from filter plant basin. This was reservoir water mixed with four-fifths Chattahoochee River water supplied by the Receiver from points of intake below Bibb Mill dam and above Seventeenth street, the source of supply from the river adopted by the Company and afterwards continued by the Receiver whenever river water had to be resorted to. The analysis shows 'no trace of alum, but the figures indicate a very bad water, albuminoid ammonia particularly high.' The water was clear and apparently all right. The Receiver on June 24th, 1904, gave public notice to water takers not to use this water for domestic purposes without boiling. The people had resort to springs, wells and cisterns and bought water. Under direction of the Court the Receiver ran a supply pipe from an outlying spring east of the City and through a centrally located street and furnished drinking water therefrom to such as would take it. (Receiver's report filed June 25th, 1904.)

"On June 25th, 1904, the State Chemist, at request of the Receiver, made analysis of river water taken by the Receiver from the river at a point above all known sewer contamination and about two miles above the pumping station. The Chemist filtered the water and reported after analysis: 'I cannot recommend the use of
284 this water.' This sample was taken near the mouth of an inflowing creek.

"On June 12th, 1904, another sample was taken just above this point, under direction of the Receiver, and on July 16th, the State Chemist filtered this water in his laboratory and reported: 'The figures indicate a very pure water.'

"Within a distance of a half mile from the point of intake from the river to what is known as Bibb Mill dam, five or six sewers and watershed drainage from a populous part of the city and from Bibb Mill factory village discharge into the river.

"The Receiver took a sample of water from the river just above Bibb Mill dam and above these sewage contaminations. A bacteriological analysis by the State Chemist of this sample made August 8th, 1904, showed 'bad water.'"

Complainant excepts to said findings on the ground that said findings ought to be modified and corrected in accordance with the request made by complainant to said Master, and duly filed with him at the time when suggestions of amendment or alteration were required to be filed by him to his draft report, which requested modification and findings is as follows, namely:

"Complainant requests and insists that in connection with said analyses should be considered and reported by the Master, as part of said finding, the sworn report of the Receiver submitted to the Master on August 10, 1904, and the sworn report of the State Chemist, J. M. McCandless, submitted at the same time as accompanying the analysis made in August, 1904, and referred to in the report and explanatory of the preceding analyses, and which are as follows:

"'The undersigned, Receiver of the Columbus Water Works Company, in pursuance of a verbal order given to him by your Honor, has caused samples to be taken and analysis made of the water taken

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from the Chattahoochee River above any source of contamination on account of the importance of the question of pure water
285 to the City of Columbus and its inhabitants. Several samples were taken and both chemical and bacteriological analyses of the water were made by Dr. McCandless, the State Chemist, and the original analysis, together with his report, are herewith submitted to the Court.

"'1st. The sample of water referred to in the analysis of June 25th, 1904, and attached to the report of Dr. McCandless, marked Exhibit A, was taken from the Chattahoochee River above Clapps' factory site, and at a point just above the mouth of Roaring Creek. This sample was taken when the river was very low. I was not personally present when the sample was taken, but learned afterwards that it was taken at a point below, and very near to the mouth of Roaring Creek, and it was thought that the particular point where it was taken was not a suitable point, and it was afterwards thought best to take another sample from a point higher up.

"'2d. To that end, Dr. McCandless was invited to come down and take a sample himself. This he did on July 12th, and the sample that was taken is that shown in his analysis of July 16th, 1904, attached to his report and marked Exhibit B.

"'3d. On August 3d, Dr. McCandless, by invitation of the Receiver, sent his assistant, Dr. R. G. Williams, Assistant State Chemist, who took three samples of water to be analyzed. The first of these samples was taken from the Chattahoochee River at Bibb Mills, just above the dam. The analysis of this sample is shown in Exhibit C, and is a bacteriological analysis.

"'4th. On the same date, August 3d, Dr. Williams, Assistant State Chemist, also took a sample of Chattahoochee River water from the clear water basin at the filtering plant of the Bibb Mills, being water filtered by the Jewel Filtering process. The bacteriological analysis of this sample is shown in Exhibit D. As will be seen by reference to this analysis, the analysis has shown this to be very pure water.

"'5th. At the same time, August 3d, 1904, Dr. Williams, the Assistant State Chemist, took another sample at the same point, namely, from the clear water basin at Bibb Mills. Two sam-
286 ples were taken at the clear water basin for the purpose of subjecting one to a bacteriological analysis, and the other to a chemical analysis. The chemical analysis of this last sample is shown in Exhibit E, attached to the report of Dr. McCandless. This analysis shows very pure water, the two analyses together indicating water of the highest purity. The result of the analysis is to demonstrate that the water taken from a point high enough up the river to be free from contamination, can be made by filtration perfectly pure, and suitable for drinking purposes, and other domestic and industrial uses. I can unhesitatingly recommend the use of the Chattahoochee River water in its filtered condition as a source of supply for the inhabitants of Columbus, for drinking and other domestic and industrial purposes.

"'The experience of recent years has demonstrated that the

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smaller streams near Columbus are so largely affected by the local drouths as to be unreliable as a source of supply. Under these conditions your Receiver recommends the adoption of the recommendations of Dr. McCandless, State Chemist, as to the use of river water.

"'(Signed) W. S. GREENE,

"'*Receiver, Columbus Water Works Co.*'"

"In accordance with instructions received through you from His Honor, Judge Newman, I have made an investigation of the feasibility of supplying the City of Columbus with pure water derived from the Chattahoochee River as an original source. I have made several analyses of the water with a view to determine this question. In case of the analysis marked Exhibit A, a copy of which is hereto attached, the sample was taken at a very low stage of water, and just below the mouth of a small stream, known as Roaring Creek, draining the adjacent watersheds; whilst many chemists would have passed this water on the analytical data obtained, as being of satisfactory purity, I declined to do so, because of my acquaintance with the water of the Chattahoochee River, and my knowledge that it was capable of yielding a purer filtrate. I did not, how-
287 ever, condemn the use of the river water on the strength of that analysis, since according to standards given in the books, it would by the majority of chemists have been accepted as of satisfactory purity. I declined to recommend it, however, and after learning the conditions under which the sample was taken, and observing the place from which it was taken, I felt that my action was fully justified. On July 16th I reported to you an analysis, copy of which is attached marked Exhibit B, on a sample of river water taken under my personal direction and supervision at a point in the Chattahoochee River just above the mouth of Roaring Creek. This sample was filtered in the laboratory, using alum as coagulant, through paper. The analysis of the filtered water showed it to be of a very high grade of purity. As I was however unwilling to recommend the water as a source of permanent public supply to the people of Columbus without a careful bacteriological analysis as well as chemical, I suggested to you the advisability of having this done. Accordingly on the 3rd of August, Assistant State Chemist Williams took a sample of the raw river water just above the dam at Bibb Mills, and another of the filtered water from the clear water tank of the Jewell filter at the mills.

"These samples were taken, with all scientific precautions, in sterilized bottles packed in ice, and shipped to me in Atlanta, where they were immediately analyzed. The result of the bacteriological analysis of the raw river water is given in Exhibit C, hereto attached, that of the filtered water from Bibb Mills in Exhibit D. This last analysis shows a water of the purest type, from a bacteriological standpoint. The number of colonies per cubic centimetre growing on gelatin at 68 F., being reduced from 2300 in the raw water to 6, and the number growing on agar at blood heat being reduced from 2000 to 5. There was no indication of the presence of any colonies of the baccillus coli in the filtered water, colonies of which are almost

invariable present in polluted water, and which may be usually found in the waters of most unfiltered streams, receiving the drainage of the cultivated and uncultivated uplands. The chemical analysis of the water from Bibb Mills, taken August 3d,
288 marked Exhibit E, and hereto attached, confirms the bacteriological, showing it to be a water of the very highest purity. I wish to say through you in a general way to the people of Columbus that this matter of pure water should be considered from a philosophical standpoint. All drinking water falls originally in the form of rain upon the surface of the earth; here it is contaminated by whatever it comes in contact with, the excreta of man and animal, the decaying bodies of animals and insects, decomposing vegetation, and with various kinds of materials. How does such water become fit for use? Simply from filtration through the earth into springs and wells. So long as the watersheds remain sparsely settled, such natural filtration is amply sufficient to remove from the water the impurities with which it is polluted when it first falls on the surface; but with increasing population and consequently increasing sources of contamination, the natural filter provided by the earth becomes overtaxed, its interstices charged with matter, which it cannot remove or properly oxidize, and the water becomes foul and unfit for use; what then is the remedy in the case of a large and growing city? Obviously to seek such a source of supply as will meet its need for all time to come in the all important matter of quantity or volume of supply, and in the next place to imitate nature's methods of improving the quality by means of efficient filtration. Man's ingenuity has enabled us to do this in a very perfect manner and to obtain by filtration from water such as that of the Chattahoochee, even if of much worse quality than that water is to begin with, a water as pure and unexceptionable as that of the deepest well, or purest mountain spring. To guarantee such water, however, it should be subjected to careful supervision, no lameness in the management should be tolerated, and frequent periodical examinations made of the filtered product.

"After the foregoing examination, I am of the opinion that the water of the Chattahoochee River, taken above the Bibb Mills dam or higher up the river, can be made by proper filtration a good supply for the inhabitants of Columbus, for all purposes, and
289 I unhesitatingly recommend the same as a source of supply for the City of Columbus.

"(Signed) JNO. M. McCANDLESS,
"State Chemist."

And complainant excepts to the ruling of the Master refusing to consider and report as a part of his said finding in connection with said analyses and as explanatory thereof the above quoted report of the said Receiver and the above quoted report of the State Chemist, J. M. McCandless; and complainant excepts to the refusal of the Master to make said finding of fact so requested by complainant, and above set forth.

Seventeenth Exception.

Complainant excepts to the finding of fact of the said Master, on page 71 of the printed report, which is in language following, to-wit:

"There is danger, however, even after filtration, if there has been contamination of water from sewer drainage and inflow of decomposed organic matter. As the population along the watershed increases, the chances of contamination increase."

Complainant submits that the said finding is contrary to the testimony in said case, and particularly to the testimony of J. M. McCandless, State Chemist, and J. M. Boardman, the experts sworn in said case, and said finding is erroneous as not being sustained by the evidence. And complainant prays that said finding may be corrected in accordance with the testimony of said witnesses named, and that said finding ought to be in accordance with said
290 testimony that the water of the Chattahoochee River taken at intake pipe at a point above Bibb Mills is, when properly filtered, a perfectly safe and wholesome water, being in every way as safe from contamination as any other practicable source of supply.

Eighteenth Exception.

Complainant excepts to the finding of fact of the said Master on page 7 of the printed report, which is as follows:

"I further find that the Chattahoochee River cannot be relied on as a constant source of supply for wholesome water, but only so when on a normal flow of the river water is taken from points above all possibility of contamination and properly filtered."

Complainant excepts to this finding as contrary to the evidence and excepts to the refusal of the Master to find as requested by complainant, to-wit:

"That the only experts who testified in the case who had given special study to the subject of filtration and who are familiar with the present state of the science of filtration, testified that under present methods of filtration the Chattahoochee River can be relied on as a constant source of supply of wholesome water and that water taken above the Bibb Mills can not only be relied on when properly filtered as a pure and wholesome water, free from contamination, but that said source is the best and only source practicable, being as free from possibility of contamination as the water of any of the smaller streams, and being the only stream whose water shed is sufficiently extended to be reliable against the local droughts, which would render the smaller streams wholly unreliable as a source of supply, and it appearing that in cities the size of Columbus outside of the flat region below the hill portion of the State of Georgia and other Southern States, known as the artesian belt, or the region
291 which furnishes flowing artesian wells, the river is the only source of supply which has been found practicable, and all other cities in the South outside of the artesian belt which are as

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large as Columbus have found it necessary to go to a river as a source of supply.

"Complainant calls particular attention to the testimony of J. M. Boardman, Dr. J. M. McCandless, and the Receiver, Major W. S. Greene, which being voluminous, it is not practicable to synopsize, or more particularly refer to."

Nineteenth Exception.

Complainant excepts to the finding of *the* fact of the said Master on page 73 of the printed report, that the former stockholders of the Columbus Water Works Company who were such in October 1890, "represented that the property cost about $200,000.00."

Complainant excepts to the refusal of the Master to find, as requested by the complainant, to-wit:

"The Master cites in support of his finding Volume 3 of the evidence, page 763, the same being the testimony of George H. Pearson. Said testimony was taken down and submitted over the objection by complainant that the same was alleged representations made to other parties, and that the representations themselves were not produced. It appears from the testimony of this witness that the alleged representations to which he refers were in writing; that they were not made to him, but to other persons when he was not present; and he has no personal knowledge as to whether in fact such representations were made or not. Such testimony was the purest hearsay, and ought to have been excluded on the objection made. Complainant before the Master insisted and now insists that said testimony should be excluded as being based on hearsay and because it appears that
292 the witness does not of his own knowledge know whether any such representations were made or not, and on the further ground that the witness testified that the same was in writing, and that no effort was made to produce or account for the writing itself.

"Complainant having objected to said testimony when offered excepts now to the finding based on said incompetent testimony, and prays that the report be corrected by excluding said testimony, and the finding based thereon as not supported by competent or proper testimony in the case.

"Complainant further submits that the witness, George H. Pearson, who delivered this testimony, is shown by the evidence to be the representative of the project known as the 'Blue Spring Project,' and very active in attacking the present system, and his testimony, in many material particulars, is in conflict with and shown to be untrue by the testimony of witnesses of unquestioned veracity, and by physical facts clearly established. He was the representative, according to his testimony, of the firm of Coffin & Stanton, whose disastrous failure shortly afterwards developed that their methods were such as no honorable firm would have been guilty of. The testimony of this witness that said firm, Coffin & Stanton, were unwilling to handle $200,000.00 of the bonds of this Company, because convinced that the Company had misrepresented the facts, when it appears that within two months thereafter Wilson, Colston & Company, dealers

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in this character of securities, of the highest character and standing, and other investors of unquestionable integrity and character in the business world, after full investigation, were willing to take $325,000.00 of bonds on identically the same property at par, and that the property, on investigation, was found to be ample security for that amount, is upon its face improbable, and the witness himself is wholly discredited by the testimony in the case."

293 *Twentieth Exception.*

Complainant excepts to the finding of fact of the said Master appearing on page 73 of the printed report, which is as follows:

"The proposed purchasers made investigation through an expert hydraulic engineer, who reported adversely, and the purchase was declined. The property was found not to be as represented."

Complainant excepts to this finding on the ground that said finding is based upon the sole testimony of George H. Pearson, who claims that he was acting for Coffin & Stanton, the proposed purchasers referred to in said finding, the testimony of which witness is discredited after being contradicted and shown to be untrue in material particulars by the testimony of a number of witnesses and by physical facts. Complainant insists that the above finding is not sustained by credible evidence, and is shown to be untrue by facts and circumstances established by the testimony of other witnesses, and particularly the facts testified to by F. M. Colston, as shown in the testimony of said Colston found reported in Volume 4, pages 1018, 1019, 1020, 1021, 1022 and 1023. Complainant insists that as shown by said testimony of F. M. Colston, the truth of which cannot be questioned, the said statement of said Pearson that said works were not as represented is contrary to the facts found to exist by a careful, thorough and conscientious examination made by a Mr. Wrenshall on behalf of the purchasers of the present bonds, and who is shown to be a civil engineer of very decided standing and character. (Volume 4, page 1018.)

294 *Twenty-first Exception.*

Complainant excepts to the finding of fact of the said Master appearing on pages 75 and 76 of the printed report, which is as follows, namely:

"The visit of Mr. Colston and his engineer was made to Columbus in October, 1890. They spent four days. The former had most of his conferences with H. H. Epping, who at that time was neither an officer nor shareholder in the Company, and made examination only of those records of the Company showing its earning capacity for the preceding year. He did not examine the records of Council or any of the books and records of the Company except as stated. He had casual conversations with prominent citizens. Heard no complaint of the water works. The engineer investigated the physical condition of the plant. His report is not in evidence."

Complainant excepts to said finding on the ground that the same is erroneous as not setting forth fully the investigation, nor all of

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he facts upon which Wilson, Colston & Company and the investors who took said bonds acted, and complainant prays reference to the estimony at large of Frederick M. Colston upon this subject, and in particular the testimony of the said Colston found in Volume 4, pages 1017, 1018, 1019, 1020, 1021 and 1022 and 1023 of the reported testimony sent up by the Master accompanying his report. The complainant says that the said Master erred in not setting forth in his finding fully what was done in the way of making an investigation and what was found upon said investigation and what investors acted upon, as requested by complainant, and complainant in particular specifies the following facts, all of which are undisputed and established by testimony of witnesses of unquestioned
295 credibility as follows, which ought to have been found by the said Master in order that his report and findings upon this subject should be correct, and not incomplete or misleading, namely: F. M. Colston has been a member of the firm of Wilson, Colston & Company for thirty-seven years, said firm being successors to William Wilson & Sons, established in Baltimore in 1802. Said firm is not only one of the oldest, but one of the most highly respected houses engaged in the handling of securities of this character in the United States.

On the 7th of October, 1890, F. M. Colston of said firm of Wilson, Colston & Company, received a letter from Mr. Samuel Spencer, who had been president of the Baltimore & Ohio Railroad and was very highly respected and regarded in Baltimore. The letter is in evidence (Volume 1, pages 358, 359 and 360), and gives a brief description of the Columbus Water Works system; sets out that the Company has a contract with the City of Columbus and the amount of hydrant rental being paid and the provision that the coupons of the bonds would be receivable for city taxes up to the amount of whatever the City's payments are, and sets out that it was proposed to issue $500,000.00, sold $325,000.00 for the purpose of retiring the older bonds, canceling the original mortgage, etc., and that $175,000.00 of the bonds were to be put in the hands of a trustee to be used under his direction for future additions to the property as needed, and it was pointed out that upon the basis of actual earnings of the Company there was a margin of net 30 per cent. above the interest on the proposed $325,000.00 of bonds, and the letter asked Mr. Colston if he was willing to undertake the negotiation
296 of the bonds, the mortgage to be drawn up to his satisfaction and he to name the trustee. The firm of Wilson, Colston & Company was extensively engaged then, as it is now, in the handling of securities of this character. The firm has negotiated bonds of about thirty water companies in the United States from New York to Mississippi and from Nebraska to Georgia. Mr. Colston testifies that he has had a great deal of experience with that character of investments. He is at present president, vice-president and director in a number of water works companies, amongst which is the largest private water company in the United States. Mr. Spencer was well and favorably known to him, and upon receiving the letter he took the matter up for thorough investigation before undertaking to

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handle these securities. A firm of the high character of Wilson, Colston & Company cannot afford to handle securities except after fully satisfying themselves that the same are of a high character and offer a good and safe investment. They employed a Mr. Wrenshall, an experienced civil engineer of very decided standing and character, and whose services they had employed on other similar occasions. He went to Columbus and made a thorough investigation of the plant and physical property of the Columbus Water Works Company and into the character of the service which said Company then furnished and had been furnishing.

Mr. F. M. Colston himself came to Columbus to thoroughly look into the situation. He spent four days in Columbus with Mr. Wrenshall. Mr. Wrenshall examined thoroughly the physical part of the plant and made a report. Mr. Colston examined the accounts of the Company in the office, took off with pencil and paper
297 a list of every consumer, took off the amount of expenditures, and after thoroughly going through the books and accounts of the Company, found that the Company had an income sufficient to pay all operating expenses and the interest upon the proposed issue of bonds, and allowed a sufficient margin for necessary extensions and improvements. He read very carefully the contract between the City and the Water Company, and having had large experience in dealing with water companies, read it with a great deal of care. There were three features in particular about the contract which very favorably impressed him: (1) that the City was willing to accept the coupons of the water bonds in payment of the hydrant rental; (2) that the provision that the City could at any time acquire municipal ownership by a procedure which was entirely fair to the City and to the Company; (3) the manner of determining whether the provisions of the contract had been properly exercised or not by the Company, although the provisions were fair to the Company and fair to the City. These provisions of the contract, being just and fair upon the face, furnished a substantial inducement in the purchase of the bonds. The bonds would not have been purchased but for the contract. Mr. Colston investigated as fully and carefully as he could how the water works were regarded by the citizens of Columbus. He met a number of the citizens and made inquiries. He talked to the then Mayor. He went around and talked to several bank presidents and to a number of representative citizens, being careful to talk with all those persons who were most likely to be in a position to know of any complaints, if complaints existed.
298 He heard no complaint of the service or of the water. The result of the investigation was satisfactory. After the report was made by Mr. Wrenshall, the civil engineer, they employed Major Venable, who stood at the head of the Baltimore bar, to investigate the legal questions. He was, as shown by the testimony, one of the finest constitutional lawyers in the United States. Mr. Venable, in the name of the firm of Venable & Packer, gave an opinion embodied in a letter to the Company, that the mortgage and bonds were in due form and constituted legal and binding obligations on the Company, and that the contract made by the Com-

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pany with the City of Columbus for supplying water to the City was within the corporate powers of the City, and was in proper form, and constituted a legal and binding obligation on the City. This letter is in evidence. (Vol. 1, page 330.)

This letter, as also the report of the engineer and a financial statement showing the earnings and operating expenses and the net income of the Company, were exhibited to the prospective purchasers of the bonds and upon these the bonds were purchased. The statement of the physical condition and earning capacity of the Columbus Water Works which was exhibited to purchasers of the bonds, is in evidence. (Vol. 1, pages 355, 357.) The bonds were regarded as a first-class investment and as being securities of the highest possible character. The bonds were all of them sold in a short while and without the slightest difficulty at par to the very best character of investors, being purchased in chief part by reason of their high character by persons or corporations handling trust funds
299 and desiring investments which offered the highest degree of security. A list of the purchasers of the bonds is in evidence, and it will be seen that the purchasers were the trustees of Washington and Lee University, of the Protestant Episcopal Theological Seminary, Protestant Episcopal Educational Society of Virginia, Farmers Loan & Trust Company, Trustee, several insurance companies, safe deposit and trust companies, and persons who were trustees for women or children, or who had trust funds in their hands for investment. All of these purchasers had every reason to believe that they were investing in securities of the highest character and did so believe.

Complainant says that the above finding of the Master is erroneous and is not a just and correct statement of the facts as shown by the uncontradicted evidence, and complainant submits that the finding of facts as to the examination made at the time the bonds were placed on the market should have been found by the Master to be as above set forth in this exception, and complainant excepts to said finding as erroneous in not setting forth the facts to be as hereinbefore set out, and in support of this exception complainant cites the testimony of F. M. Colston, (Vol. 4, and particularly pages 1015, to 1023 inclusive and pages 1032, 1033 and 1034), the letter of Samuel Spencer to F. M. Colston of October 6, 1890, (Vol. 1, pages 358 to 360), list of bondholders, (Vol. 1, pages 358 to 361), state of physical condition of properties, earnings, contract provisions, etc., of Columbus Water Works furnished by Wilson, Colston & Company to prospective purchasers to induce purchase of bonds, and upon which the purchase was made, (Vol. 1, pages
300 355 to 357), opinion of Venable & Packer submitted to bondholders as to the validity of the water works contract, etc., (Vol. 1, page 330, and Vol. 1, page 353), affidavit of John Gill of R., purchaser of bonds, used in evidence by consent in lieu of depositions, (Vol. 1, pages 329 and 330), testimony of Julian T. Burke, (Vol. 4, pages 1100, etc.)

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Twenty-second Exception.

Complainant excepts to the finding of fact of the said Master appearing on page 77 of the printed report, which is as follows, namely:

"There is no direct evidence of the value of the system prior to January 1st, 1891. The testimony of the engineer who examined the system at that time for the New York parties is that it could have been duplicated for $116,000.00. The engineer who reported to the City on the efficiency of the system in November, 1893, found that it could have been duplicated for $119,000.00. If 10 per cent. be added for the value of the existing service at either date the value of the system in October, 1890, would have been $127,600.00, and in November, 1893, $130,900.00. The Company expended an amount of $20,000.00 on the system from 1891 to 1893, inclusive. This included land purchased, meter boxes, etc. This amount deducted from the valuation of 1893 would have left the value on January 1st, 1891, to be $108,000.00. The syndicate fixed its value at $325,000.00, based alone on its reported earning capacity for 1889."

And complainant excepts to said finding as erroneous in that the same is not a correct finding of the value of said property in 1891, 1893, or at the other times referred to in said finding, and is not a correct finding of the facts established by the testimony as to
301 the value of said property, and is not upon a true and correct basis of valuation of said property, and complainant says that said finding is erroneous upon the grounds and for the reasons herein set forth, namely:

"Complainant did not deem it necessary to introduce testimony as to the value of said property in 1891, as complainant did not then, nor does complainant now, believe said question to be material to any of the issues in the case, it being complainant's contention that the bondholders are entitled to be protected to the extent of all the property that is there, and to the extent of all the various elements entering into the value of said property, whether said property were worth at the time the bonds were issued more or less than the amount for which the bonds were issued.

"Complainant insists, however, that various elements of value appear from the evidence which have been omitted from consideration and excluded from the estimates made up by the Master of the value of said property, both as the same existed in 1891 and at subsequent dates. These elements are, many of them, pointed out in the testimony of J. M. Boardman, a witness for the complainant, and in the testimony of Frederick M. Colston, a witness for complainant, and complainant prays reference to said testimony in fixing upon the value of said property, so far as it may be deemed material to consider its value.

"Complainant calls attention to the fact that the testimony of the engineer referred to in the finding, that according to such testimony the system could have been duplicated for $116,000.00, was the testimony of George H. Pearson, and an examination of the testimony of said witness and a comparison of said testimony with the

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estimony of other witnesses and the physical facts established in he case, show that the same testimony is wholly unworthy of credit. t appears from the testimony of the said Pearson that in arriving t said valuation, he excluded from the account numerous elements vhich ought properly to have been included.

"The engineer referred to in the finding that 'the engineer
302 who reported to the City on the efficiency of the system in November, 1893, found that it could have been duplicated or $119,000.00,' was B. M. Hall, whose printed report is in evidence, nd a reference to said report and to the testimony of B. M. Hall, vho was called as a witness, shows that the witness omitted from said omputation various elements of value and valuable items of prop- rty, and said valuation was made up in a manner wholly different rom that in which, as matter of law, and as shown by the evidence, uch valuation should be made. It appears further that at the time aid report was made said witness had never constructed a system of vater works, and that he has never constructed any system of water vorks up to the present time, and said witness was therefore entirely honest in omitting elements of value and elements of cost well known to all persons familiar with the practical construction of water works.

"Complainant insists that the estimate of the said Pearson and the said Hall, as well as the calculation made by the Master, leaves out of account many elements which go to make up the cost and value of a completed system of water works as shown by the testimony; that it appears from the testimony that an approximate estimate could not be made without careful measurements and estimates by an ex- pert engineer familiar with the practical work of constructing and operating a system of water works; that this is especially true, because as shown by the evidence, the largest part of the cost of a system of water works is usually to be found in the assembling and putting together of the various component parts, and not in the first cost of the component parts; the cost of the component parts, such as pipes, pumps, tanks, valves, hydrants, etc., being but a small portion of the cost of the completed plant, which also includes excavations, joining pipes, making foundations, engineering and skilled labor, also interest on the investment between the time when the work is begun and the works become remunerative as a finished system; also, the cost of marketing the bonds; also, the various connections between the pipes in the streets and the buildings in the City, and all those various elements which make the difference between a dead structure
303 and a living and going business, all of which elements were excluded from the computation.

"Complainant insists that the estimate of value contained in said finding is also erroneous, both as not based upon an accurate estimate of cost, and also as eliminating various elements of value proper to be considered, as shown by the testimony and by the rule of law laid down by the Court; that said estimate excludes all those elements of value arising out of the fact that the system of 1890, on January 1, 1891, and in 1893, was a going concern, embracing that element of value which flows from the established connections between the pipes

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and the buildings in the City, and from the fact that the system was actually in operation not only with the capacity to supply the City, but actually supplying many buildings in the City, not only with the capacity to earn, but actually earning, and embracing all those elements of value which enter into and form part of the value of a system of water works considered as a going concern, and excluded the value arising out of the franchises and earning capacity, and out of the fact that the Company was then actually earning the revenues shown by the evidence to have been derived at the several dates named.

"Complainant insists that the finding that the Company expended the amount of $20,000.00 on the system from 1891 to 1893, inclusive, is erroneous, and that the actual amount expended during said period was considerably in excess of the amount named, as will be shown in connection with calculations further on. It appears from the undisputed evidence that there was expended for betterments between December 31, 1891, and December 31, 1893, inclusive, $43,919.13, the items being taken from the books of the Company. (Volume 1, pages 361, 362).

"Complainant insists that the finding that the syndicate fixed the value of the water works at $325,000.00, based alone on its earning capacity for 1889, is not correct, the testimony being that the engineer was employed who furnished a detailed statement of the physical property and the value therof, and that this estimate was made up of the property as a going concern and was based largely upon the value of the physical property and partly upon
304 the value of the franchises and in part upon the satisfactory character of the service then being furnished, and the satisfaction which the system gave to the City and its inhabitants. And complainant calls attention to the testimony of Frederick M. Colston, touching the method employed in arriving at the value of the different elements entering therein, and which was shown by other testimony to have been a correct method of arriving at the value of said property; and it appearing from the testimony of the said Frederick M. Colston that the value was $325,000.00 on January 1, 1891, on a basis of property actually owned by the Company considered as a going concern. (Vol. 4, pages 1018, and following: 1034, 1063, 1064, 1070, 1071, &c.)"

Wherefore, complainant excepts to said finding as erroneous and submits that the finding of fact by the Master should have been as hereinbefore set forth. All of which complainant requested the said Master to find, and the said Master refused.

Twenty-third Exception.

Complainant excepts to the finding of fact of the said Master, on page 78 of the printed report, that $325,000.00, being the amount of the bonds used and sold in payment for the property and in retiring the issue of $150,000.00 of bonds, and in paying off the other indebtedness of said Company, was a price largely in excess of the actual value of the property of said Columbus Water Works Company.

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Complainant excepts to said finding as erroneous, and submits that said finding is not sustained by the evidence and is not based upon a true and proper basis of valuation, and does not embrace the different elements proper to be considered in arriving at the value of
305 said property, and complainant submits that the testimony of the witnesses in said cause best in position to know, and the only witness who undertook to give an estimate based upon the elements proper to be considered in arriving at said value, to-wit: the said F. M. Colston, placed the value of said property at over $325,000.00. And complainant requested the Master to find in accordance with the foregoing suggestion, and excepts to the refusal of the Master so to find.

Twenty-fourth Exception.

Complainant excepts to the finding of fact of said Master that the syndicate who originally purchased these $325,000.00 bonds knew, or had every opportunity of knowing, that the price paid was largely in excess of the actual value of said property. Complainant submits that the said finding is erroneous and contrary to the evidence, and that the fact should be as shown by the testimony, namely: that an investigation was honestly and fairly made by F. M. Colston, member of the firm of Wilson, Colston & Company, who undertook to handle and sell said bonds, and who accepted said bonds at 90c on the $1.00, and re-sold the same over their counters at par; and that said purchase took into proper consideration the different elements of value then existing as fully explained and set forth in the testimony of said F. M. Colston; and that said amount was not largely in excess nor was the same at all in excess of the value of said property considerered as a completed system and as a going concern, having a capacity to earn money and actually earning money and em-
306 bracing its franchises, including the Company's contract with the City of Columbus. And as the complainant submits the facts to be, it does not appear from the evidence that the original purchasers of the bonds knew, or ought to have known, that said price was largely in excess or was at all in excess of the value of said property. On the contrary, it appears that said bonds found ready sale at par to prudent and careful investors and all of them sold at par to the high class of investors, and were regarded by such investors, who were persons of great care and prudence, as an excellent investment at par. That on this account said bonds were purchased by corporations having the investment of trust funds such as fidelity and trust companies, educational institutions, charitable institutions and other similar investments, and by natural persons charged with the investment of trust funds for orphans, widows, and other females, charitable, educational and trust institutions, and who in the exercise of a degree of care commensurate with the high trust imposed upon them, purchased these bonds at par as a thoroughly safe investment and the security was regarded by all as ample and unquestionable. And in support of this exception complainant cites the testimony of the said F. M. Colston hereinbefore referred to, the

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testimony of Julian T. Buke hereinbefore referred to, the testimony of John Gill of R. hereinbefore referred to, and the list of purchasers of said bonds (in Vol. 1, pages 348, 351). And complainant says that said finding was erroneous as not being in accordance with the facts above set forth, and complainant says that the
307 Master erred in not finding the facts as requested by the said complainant and as hereinbefore set forth.

Twenty-fifth Exception.

Complainant excepts to the finding of fact of the said Master touching the purchase of bonds by the original purchasers and by the subsequent holders thereof as set forth on pages 76, 77 and 78 of the printed report, on the ground that the finding is not a correct or full setting forth of the facts necessary and proper to be found by the said Master upon said subject, and as shown by the evidence, and complainant says that the Master erred in not finding as requested by complainant and in refusing to find the finding of fact requested by defendant, which finding of fact so requested and which the said Master refused to find is as follows, namely:

"It appears from the evidence and should be found by the Master that the purchasers of the property paid therefor $325,000.00 of the first mortgage bonds of the Columbus Water Works Company, of date January 1, 1891, and secured by a mortgage of that date, of which a copy is attached to complainant's bill, marked Exhibit 'A'; that Wilson, Colston & Company, a firm of the highest character and standing, undertook to negotiate and sell the bonds, being approached by Samuel Spencer, a man of integrity and character, who, with three other associates, likewise men of character and standing, had purchased the property and wished to dispose of the bonds in order to realize the funds to pay off the bonded indebtedness and the purchase price. Wilson, Colston & Company were then, and are now, men of the highest character and standing. The business was established by William Wilson & Company, at Baltimore, in 1802,
308 and Frederick M. Colston has been a member of the firm since 1867, since which time the firm name has been Wilson, Colston & Company. They have had great experience in the handling of water works bonds, having in the past thirty-seven years negotiated bonds of about thirty water companies in all parts of the country, and Mr. Colston, who gave the matter his immediate attention, having looked personally after that part of the business, and being president, vice-president, and director in a number of leading companies, embracing the largest private water works company in the United States. Before Wilson, Colston & Company agreed to negotiate the bonds, a thorough investigation was had.

"The firm of Wilson, Colston & Company, on account of its well-known character and standing, could not afford to be connected with the negotiation of water works bonds except the fullest investigation had satisfied them that the security was ample. Mr. F. M. Colston came in person to Columbus and spent four days there in

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thoroughly investigating the situation, and, having had a very large and successful experience, the investigation which he made was of the most thorough character. During that visit he talked with the Mayor of the town, the different bank presidents, and a number of prominent and representative citizens, and was assured by all that the system and the service were thoroughly satisfactory, and during a thorough and painstaking investigation, heard no complaints whatever, and ascertained that no complaint or cause of complaint existed. Mr. Wrenshall, a civil engineer of very high character and standing, came to Columbus and made a thorough investigation, and reported upon the physical properties of the Company, which report was entirely satisfactory, and was shown the persons who subsequently purchased the bonds. Mr. Venable, who stood at the head of the Baltimore bar, and was one of the most eminent constitutional lawyers in the United States, was employed, made a thorough investigation into the validity of the contract and of the different legal questions involved, and entering into the value of the security offered. His opinion was shown purchasers of the bonds, and his original letter was offered in evidence. After a thorough and
309 exhaustive investigation, Wilson, Colston & Company, having found everything satisfactory, undertook the negotiation of the bonds, accepted the entire issue at 90 cents, and proceeded to offer the bonds for sale to their customers, and in connection with Browne & Lowndes, who acted as their agents and in conjunction with them in the matter, sold the whole issue within 30 days at par. This was a most excellent showing for bonds of this character, and such a sale was only possible because the security was deemed ample, and the bonds were regarded as an investment of the safest and most satisfactory character. The purchasers of the bonds, all of them, paid par therefor; purchases were made in actual money, and the money paid in cash. The list of bondholders is in evidence, and the high character of the investors will be at once seen from an examination of the list. A very large portion of the entire issue was sold to persons having the handling of trust funds, and representing charitable and educational institutions, and having the handling of funds of widows, orphans, females, and other trusts, and who deemed the investment absolutely safe, and regarded the security as ample. The firm who sold these bonds is of the highest standing in the business world, and has always been exceedingly careful in its examination into the character of securities offered before undertaking to sell the same to its customers, and throughout its long course of business has been eminently successful in handling only securities of the highest character. These facts appear from the testimony of F. M. Colston, Julian T. Buke, and a number of the bondholders, and the list of purchasers is in evidence and speaks for itself."

Twenty-sixth Exception.

Complainant excepts to the finding of fact of the said Master on page 81 of the printed report immediately following the finding that

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a statement submitted in evidence and appearing in Vol. 1,
310 page 361, showed an expenditure for betterments from January 1, 1891, to July 1, 1902, of $92,749.00, which is in the following words:

"Items to the amount of $15,233.90 should be deducted from this as not properly chargeable to betterments. This last amount is made up of purchases of lands and maps and surveys in 1892 and 1893 for a contemplated additional reservoir, which was not constructed, and for discounts on bonds delivered to and sold by the Company. The amount properly chargeable to betterments is $77,515.10."

Complainant submits that said finding is erroneous, and that the finding of fact by the said Master should have been as requested by the complainant, which request was as follows, namely:

"Complainant insists that it appears from the evidence that the lands purchased for the contemplated additional reservoir, and the maps and surveys for which expenditures were made for the construction of the said additional reservoir constitutes items of betterments properly chargeable to betterments, and that it appears from the evidence that said additional contemplated reservoir would have been constructed but for the fact that the City repudiated the contract between itself and the Water Works Company before such construction could be had.

"Complainant insists that it is not according to equity and good conscience or permissible that the defendant City of Columbus by its repudiation of a valid contract should prevent the Water Company from completing contemplated improvements, and thereby deprive said Company of its right to have the expenditures already made for said purpose considered and charged as betterments to the system, for which the Company should be given due credit, and that any loss arising from the non-completion of said improvements is chargeable to the City of Columbus, and the City should be held to account therefor.

"Complainant insists that the item of discounts in placing its bonds
is a necessary element of cost of betterments and is properly
311 chargeable to betterment account, and more particularly since it appears from the uncontradicted evidence that but for the City's wrongful act in repudiating a valid contract, said bonds could and would have been all of them sold at par."

Wherefore complainant submits that the finding as made by the Master was erroneous, and that the Master erred in not finding the fact to be as hereinbefore set out, and as the said complainant requested him to find.

Twenty-seventh Exception.

Complainant objects to the finding of fact of the said Master on page 82 of the printed report, which is as follows, to-wit:

"A comparatively few expenditures were made for betterments prior to the extension into the annex."

Complainant says that said finding is erroneous, and that the

facts were as complainant requested the Master to find, and that the Master erred in refusing to find as requested by complainant, and said request being as follows, namely:

"That it is shown by the evidence that from the time the present owners of the Company acquired their ownership by purchasing all the stock in 1891, up to and including the year 1893, $43,919.36 were expended by said Company in betterments, and that further improvements and betterments were in contemplation and would have been made, but for the City's act in repudiating said contract, which repudiation followed shortly after said last mentioned date; and was already in contemplation prior thereto as evidenced by the City's act in employing a surveyor to make plans for the construction of a system to be owned by the city.

"Complainant insists that the expenditures of $43,919.13 for betterments in a system which was already in a good condition and giving excellent service was not a comparatively small ex-
312 penditure for betterments, but was on a scale of liberality and in keeping with the liberal policy instituted by the new management under which $175,000 of bonds were reserved for the making of betterments and extensions, all of which bonds had already market value of par up to the time the City entered upon its course of conduct looking to the repudiation of its contract."

Twenty-eighth Exception.

Complainant excepts to the finding of fact of the said Master appearing on page 82 of the draft report, which is as follows, namely:

"The project of an additional reservoir contemplated in 1892 and 1893 was abandoned as impracticable."

Complainant submits that said finding is erroneous and contrary to the evidence, and that the facts were and should have been found by the said Master to be that said project was not abandoned as impracticable, but that the failure to construct said reservoir was due to the City's conduct in repudiating the contract and in destroying the Company's ability to market its bonds; complainant having requested that such finding be made by the Master, complainant submits that the failure to so find as requested was error, and complainant excepts to the refusal to find as so requested.

Twenty-ninth Exception.

Complainant excepts to the finding of fact of the said Master on page 83 of the printed report, which is as follows, to-wit:

313 "In December, 1902, the Company admitted the necessity of foreclosure, and that it had not maintained and improved the system as the growth of the City demanded. The reason for this, as stated by the President of the Company, was want of funds, the attitude of the City towards the Water Company, and other causes. The system needed reinforcements and strengthening in 1892, and in 1902. Every system should be thus treated every ten years."

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Complainant excepts to said finding on the ground that the same is erroneous and is not a full and correct statement of the purposes of the foreclosure suit, and complainant submits that the Master should have found as requested by the complainant, said request being, and as complainant submits the facts, requiring that the finding should be as follows:

"Complainant insists that the finding that the system needed reinforcement and strengthening in 1892 should be qualified and amended by the statement that the Company in 1892, and prior and subsequent to that time made extensive betterments, improvements, and extensions, and was engaged in still further improving the system at the time the City repudiated its contract, it appearing from the evidence that from 1891, the time when the present owners acquired the property, until the close of 1893, shortly before the repudiation by the City of its contract, the Company expended $43,919.13 in improvements and extensions, and still others were in contemplation and under actual headway at the time the contract was repudiated, and $175,000.00 of first mortgage bonds, having ready sale at par, was reserved for the purpose of making such improvements and extensions as the growth of the City should call for.

Complainant insists that it further appears from the testimony that despite the City's action, the Company made extensive improvements subsequent to the City's repudiation of its contract; that when
the City, by its conduct, destroyed the ability of the Com-
314 pany to market its bonds, the bondholders who already held the bonds of the said Company, put up further money and purchased other bonds, although fully aware that they were buying bonds which the City's action had rendered unmarketable, and invested said money as a forced contribution rendered necessary by the City's action; and further agreed to forego a portion of the interest on the bonds on the agreement that the amount of the interest deducted should go to improvements and betterments of the system, and by this means additional improvements and betterments continued to be made, making an expenditure for betterments from December 31, 1891, to July 1, 1902, inclusive, of $94,489.13.

"Complainant insists that the finding that every system should be reinforced and strengthened once in ten years is not sustained by the evidence, the evidence rather tending to show the reinforcement and strengthening should be from time to time as needed, and not at intervals of ten years or other regular intervals of time, it appearing from the evidence that the material which forms the chief item of construction *were* almost indestructible, cast iron pipe having a life of 75 or 100 years, or perhaps longer, and it not appearing that the growth of the City increased by leaps and bounds at each ten year period, the only subsequent increase within the census period being caused by annexation between 1880 and 1890, and the entire increase of population between 1890 and 1900 being 311 upon a total population of over seventeen thousand inhabitants; and it appearing that the actual consumption of water has shown but slight increase from 1891 to the present time.

"Complainant insists that the improvements within the period stated have been substantial, including a pumping station, a new standpipe, greatly increasing the pressure, and a very considerable increase in the distribution system, the total length of pipes being at the time the contract was accepted by the City five miles, a large portion of which was 4 inch mains; whereas in 1902 the total length of pipes in the distribution system aggregates twenty-six miles, no
4 inch mains having been laid by the present ownership, ex-
315 tending from 1891 to 1902, and the increase being in a large part made up of larger sizes of mains."

Wherefore complainant excepts to the finding of the Master as made, and excepts to the refusal of the Master to find the facts as requested by complainant, and as the same are hereinbefore set forth.

Thirtieth Exception.

Complainant excepts to the finding of fact of the said Master appearing on pages 83 and 84 of the printed report, and being as follows, to-wit:

"I find that the Company has not been able, for the want of available funds, to maintain and improve its system as the growth of the City demanded, and that extensions since 1891 have, from time to time, been, with the exception of a small amount, paid for by a necessary increase of a bonded indebtedness originally out of proportion to the earning capacity of the system and constantly growing further beyond the ability of the system to maintain. I further find that the system has not been reinforced and strengthened as its needs required, and that the owners of the bonds recognized this fact."

Complainant excepts to said finding as erroneous, and that the finding of the Master should have been as requested by the complainant, to-wit:

"On the contrary, the evidence establishes that in 1891 $175,-000.00 of the first mortgage bonds of the said Company were set apart for the purpose of improving and extending and bettering the system from time to time as the growth of the City might require, and that said fund would have been ample but for the City's action in repudiating its contract and rendering a further sale of the bonds
impossible, except so far as purchasers of the original $325,-
316 000.00 purchased additional bonds after the same were rendered unmarketable as a forced contribution in order to preserve their investment already made.

"Complainant insists that up to the time of the repudiation by the City of the contract, the extensions and improvements made were on a liberal scale, looking to the future needs of the City and beyond what was immediately required, and that the policy thus instituted was thwarted by the City's repudiation of its contract.

"Complainant insists that the finding that the bonded indebtedness was originally out of proportion to the earning capacity of the City and constantly further growing beyond the ability of the system

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to maintain, is not supported by the evidence. Complainant insists that the evidence shows that upon a careful investigation it was ascertained that the amount of bonds issued in 1891 was safely within the earning capacity of the system, and the same was true of the amount set apart for future extensions and improvements, and that the earnings sufficed to pay the interest on the bonds until the City by its repudiation of its contract made it necessary for the bondholders to reduce their interest in order to set apart the amount of such reduction to the account of betterments owing to the fact that the City not only thus crippled the credit of the company but by its action caused losses of revenue, and other losses in many ways; and that any failure to extend the system was due solely and entirely to the City's wrongful act in repudiating its contract as shown by the entire evidence in the case."

Wherefore complainant excepts to the said finding as made by the Master on the ground that the same is erroneous, and complainant submits that the finding by the Master should have been in accordance with the request of this complainant as hereinbefore set forth.

317 *Thirty-first Exception.*

Complainant excepts to the finding of fact of the Master appearing on page 85 of the printed report of the amount expended by the Receiver for betterments, on the ground that the said Master should supplement said item of betterments by adding thereto the betterments expended by said Receiver from and after January 1, 1904, up to the filing of the report, and excepts to the refusal of the Master to supplement and amend said finding by including therein the items of betterments expended by the Receiver since that date, in particular embracing cost of Bibb Mill extension, including pipe, pumping engine, labor and sundry small items $10,000.00 and cost of pipe line, etc., to Dinglewood Springs, $1,000.00, as requested by complainant.

Thirty-second Exception.

Complainant excepts to the finding of the Master on the subject of the value of the system of water works, the same being set forth on pages 87, 88 and 89 of the printed report, and being the 18th head or subject into which the said report is divided and being in language following, to-wit:

"To ascertain the value of a water works system there must be considered the elements of quality of material, cost of installation, and estimates of value as a going concern or its good will. Section XLII of the contract provided for ten per cent. to be added to the ascertained value of the property, which I assume is the estimated value of the good will.

318 "The system could have been duplicated in November, 1893, (Hall's report, page 40) for $119,000.00

The reservoirs were valued at	$18,000.00	
The 4 miles of supply main (21,120 feet) at $1.05 foot, laid	22,176.00	
The betterment account (Vol. 1, page 366) shows cost of Stewart Spring property and McElvey land not utilized	7,189.00	
Ditto submerged mains	6,712.75	
	$54,077.75	
Deduct		$54,077.75
Leaving value of system within city at close 1893		$64,922.25
Betterments added since January 1st, 1894, to date Receivership		62,260.38
		$127,182.63
Deduct value of 24,700 feet 4-inch pipe, costing 36 cents per foot laid		8,892.00
		$118,290.63
Add betterments made by Receiver, not including 7 acres land not utilized by him		42,220.85
		$160,511.48
Add 10 per cent. for value good will—that is, the connections with and supply of buildings		16,051.14
Total present value of plant as going concern		$176,562.62

"I have deducted the value of the 4-inch pipe because it is worthless for distribution purposes, except to be taken up and relaid for service extension. The Company laid no 4-inch pipe after 1895. I have also eliminated the Alabama property as of no value to the present system, because unreliable, and the submerged main because it failed at the first test, and I have made no deduction for depreciation, as the piping is practically as good as when laid, and the standpipes, valves, pumps and property, other than the piping, I have also considered without any deduction for depreciation, as there was no evidence disclosing depreciation, and the receiver was giving efficient service through the system, with the river as his
319 source of supply, showing the efficiency of the distribution system under the improvements which he had made when considered as to the sole question of the capacity of the system for delivering water. The above total valuation is for only such parts of the system as are available and capable of use for future operation of water works. They, however, must be considered in connection with the river as a source of supply, as they are now so operated. The evidence with relation to values of the system as it stood at the

conclusion of the hearing was by no means satisfactory, but with such as was submitted I find the present estimated value of the available portions of the system, with the river as a source of supply, to be $176,562.62."

Complainant excepts to said finding as erroneous in the method of valuation adopted by the said Master, and in that the Master excludes various and important elements entirely from the value of said property, and which ought to have been considered, and complainant submits the following:

"Complainant insists that under the method actually adopted there is included practically nothing except cost of material. Complainant insists that it appears from the evidence that even an approximate estimate of the cost of a system of water works could not be made without careful measurement and estimate, with all the assistance to be derived from the books of the Company, by an expert thoroughly familiar with the practical work of water works construction and operation and that no such estimate was undertaken or attempted.

"Complainant insists that it is shown by the evidence that the largest part of the cost of a water works system is to be found in the assembling and putting together of the various component parts; the cost of the component parts such as pipes, pumps, tanks, valves, hydrants, etc., is but a small portion of the cost of a completed plant, which also includes the excavating, joining pipes, foundations, engineering and skilled labor; and that still an additional element to be considered is the interest on the investment between the time
320 when the work is begun and the works become remunerative as a finished system, and that no proper allowance was made for these different items of cost and of value.

"Complainant insists that the estimate taken from Hall's report is not a correct basis of estimate for the reason that it appears that said witness is not familiar with the practical construction and operation of water works, having never even constructed or operated such a system; and further that his estimate failed to take into account several large elements of physical problems as appears from his testimony, and from other testimony in the case, and from a comparison with the items in his valuation with the items going to make up the system as shown by other evidence in the case.

"Complainant insists that said estimate is further erroneous in being based upon cost of material shown to be less permanent and valuable than the material actually employed in the construction of said system.

"Complainant further insists that the valuation adopted by the Master is erroneous, in making no allowance for the very considerable increase in the cost of iron pipes and other materials between the time that said estimate was made and between the time when the various pipes were purchased and the present, growing out of the great advance in the price of iron and steel.

"Complainant insists that said finding and estimate is erroneous in excluding from the value of the system reservoirs and the four mile supply main, and the cost of the Stewart Spring property and McElvey land not utilized, and the submerged mains, all of said

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items being items of cost incurred by said Company, with the City's knowledge and consent, in carrying out its contract with the City, and for the said Company should be allowed due compensation.

"Complainant insists that said estimate and finding is erroneous in deducting the value of the 4-inch pipe, it appearing from the evidence that all of the 4-inch pipe which was laid at the time the system of water works was constructed was laid under the express provisions of the contract, and in accordance with detailed
321 specifications and a map which had been submitted to the City before the contract was entered into, and which is referred to in the contract, the contract providing that the system should be constructed in accordance with said map and specifications, and being laid under the direct supervision of a special committee appointed by the City, upon which was an engineering expert of well-known ability; that all of the 4-inch main subsequently laid was laid with the City's knowledge and approval, and under the provisions of the contract which provided that the price to be paid by the Company on extension should vary according to the size of the pipes laid, being 50 per cent. greater in the case of 6-inch pipe than in the case of 4-inch pipe, and the smaller size being adopted to meet the wishes of the City, the City desiring to obtain the benefits of the cheapness of the annual cost due to the use of the smaller size, and that it would be wholly inequitable to exclude from the valuation the pipe of said size so used.

"Complainant further insists that it is shown by the testimony of J. M. Boardman and of other witnesses that the 4-inch pipe can all be made valuable as a part of the proposed system, and that by tying up the ends and reinforcing the cross lines of larger pipe at appropriate intervals, that all the pressure desirable can be obtained by the use of the present 4-inch pipe in its present position, and that the taking up of said 4-inch pipe would be a great and needless waste and sacrifice of value.

"Complainant insists that by the terms of the contract a method is provided for taking up mains and replacing with larger mains, or by change of the plan of the system whenever it is demonstrated that any main is too small by the test laid down in the contract; that until demonstrated to be of insufficient size by such test the Water Works Company has the fixed and absolute contract right to have continued the use of the present size pipe.

"Complainant further insists that one of the elements of value to be considered in any system is the fact that the party who constructs the system is entitled to an allowance for the probable cost in changes of construction that may become necessary from time to time, and that any system of valuation which makes no allowance for
322 such cost, and restricts the value to the first cost, deducting all items of cost that may subsequently become disused, is unjust and improper.

"Complainant insists that the excluding from the value the lands purchased by the Receiver under orders of the Court, and not yet utilized, is erroneous—particularly as it is shown that it is necessary in any system to provide in advance for future needs in this manner,

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and that whatever source of supply may ultimately be adopted, such provision is wise and necessary, and by safeguarding the investment already made adds materially to the value of the system as a whole.

"Complainant insists that the method adopted by adding 10 per cent. to the first cost of materials for value of good will is erroneous—the 10 per cent. specified in the contract, which was to be added to the valuation that might be placed upon the property by experts, being not a per cent. of the first cost, but 10 per cent. of the physical value of the property considered as a going concern, and including the element of value arising out of the franchises and earning capacity, and out of the fact that the system was actually earning revenue.

"Complainant insists that the franchises of said Company constitute a proper element of value and should have been included in the valuation.

"Complainant insists that the earning capacity of the system should be considered as one of the elements of value, and should have been taken account of in the valuation.

"Complainant insists that the mere cost of reproducing the Water Works plant would not be a fair test of the value, even excluding therefrom the franchise, because that does not take into account the value which flows from established connections of pipes and the buildings of the City, nor the increment arising out of the fact that the system is in actual operation, not only with the capacity to supply the City, but actually supplying the City and its inhabitants, not only with the capacity to earn, but actually earning revenue, and being a live, going concern, and not a mere dead system.

"Complainant insists that the valuation found is wholly
323 inadequate, and complainant asks that in addition to revising the valuation in accordance with the suggestions above made, that the Master recommend the appointment by the Court of experts to make a valuation of said properties and of said system out of due regard to all the interests concerned."

And complainant having requested that the Master find in accordance with the above suggestion, complainant excepts to the refusal of the Master so to find.

Thirty-third Exception.

Complainant excepts to the following finding of fact of said Master, being "Finding No. 1" in the summary of findings of fact in said report, and being on page 91 of the printed report, to-wit:

"I have found that acceptance by the City was based on statement of the Water Company that the system had been completed in compliance with the contract and upon assurances by the Company that the water would be wholesome, abundant and lasting."

Complainant excepts to said finding as erroneous on the grounds and in the particulars hereinbefore stated, and prays that said finding may be changed and modified in accordance with the suggestions hereinbefore made.

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Thirty-fourth Exception.

Complainant excepts to the following finding of fact of said Master, being, "Finding No. 5" in the summary of findings of fact in said report, and being on pages 91 and 92 of the printed report, to-wit:

324 "That from 1889 to May, 1900, there was dissatisfaction and complaints on the part of the City because of insufficiency of the water supply, and especially with the unsupplied needs of the City for water in its newly acquired territory; that the Company had notice of this and recognized the necessity of increased water supply; that during this period the City, through its Council, twice made an effort to repudiate the contract, but were not sustained by the requisite popular vote, on submission of the question to the people; that the Company in good faith endeavored to adjust the differences by offer to arbitrate and the City declined the offer, and that finally the City accepted the existing conditions and concluded a supplemental agreement by which the City was given an opportunity to test its ability to carry out the requirements of the contract; that the Company failed in this, and that in 1902, both the Council and the people determined to no longer depend upon the Water Company."

Complainant excepts to said finding as erroneous on the grounds and in the particulars hereinbefore stated, and prays that said finding may be changed and modified in accordance with the suggestions hereinbefore made.

Thirty-fifth Exception.

Complainant excepts to the following finding of fact of said Master, being "Finding No. 6" in the summary of findings of fact in said report, and being on page 92 of the printed report, to-wit:

"That the Water Company has at no time complied with Section III, requiring a reservoir of 125 million gallons available supply, and from 1884 it has failed to comply with the requirements of Section XII as to the construction and maintenance of the reservoirs."

325 Complainant excepts to said finding as erroneous on the grounds and in the particulars hereinbefore stated, and prays that said finding may be changed and modified in accordance with the suggestions hereinbefore made.

Thirty-sixth Exception.

Complainant excepts to the following finding of facts *of facts* of said Master, being "Finding No. 7" in the summary of findings of fact in said report, and being on page 92 of the printed report, to-wit:

"That Paragraph XI as to filtration has not been complied with on the part of the Company."

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Complainant excepts to said finding as erroneous on the ground and in the particulars hereinbefore stated, and prays that said find ings may be changed and modified in accordance with the suggestion hereinbefore made.

Thirty-seventh Exception.

Complainant excepts to the following finding of fact of said Mas ter, being "Finding No. 8,, in the summary of findings of fact i said report, and being on page 92 in said report, and being on pag 92 of the printed report, to-wit:

"That the Company has failed to comply with Section V of th contract as to distribution in not connecting together the ends of it system and placing mains sufficiently large to at all times give ful supply of water."

Complainant excepts to said finding as erroneous on the ground and in the particulars hereinbefore stated, and prays that said find ing may be changed and modified in accordance with the suggestion hereinbefore made.

326 *Thirty-eighth Exception.*

Complainant excepts to the following finding of fact of said Mas ter, being "Finding No. 9" in the summary of findings of fact i said report, and being on page 92 of said report, and being on pag 92 of the printed report, to-wit:

"With reference to the supply of water, I have found that th Company has failed to comply with Sections I and X in that sufli cient supply of wholesome, constant and ample water has not, an cannot be furnished from the source of supply as selected, nor i the same sufficient to meet the wants of the City and private con sumers for present and future requirements."

Complainant excepts to said finding as erroneous on the ground and in the particulars hereinbefore stated, and prays that said find ing may be changed and modified in accordance with the suggestion hereinbefore made.

Thirty-ninth Exception.

Complainant excepts to the following finding of fact of said Mas ter being "Finding No. 10," in the summary of findings of fact i said report, and being on page 92 of the printed report, to-wit:

"I have found that the Company has not complied with Sectio IV as to supply main."

Complainant excepts to said finding as erroneous on the ground and in the particulars hereinbefore stated, and prays that said find ing may be changed and modified in accordance with the suggestion hereinbefore made.

327 *Fortieth Exception.*

Complainant excepts to the following finding of fact of said Mas ter, being "Finding No. 11" in the summary of findings of fact i

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said report, and being on pages 92 and 93 of the printed report, to-wit:

"That as to pressure from 1893 to 1902, the pressure was variable and uncertain; that the gravity plan could not sustain it to the requirements of the contract, and that the standpipe and pumping devices adoped to assist it, while practically beneficial, were not at all times satisfactory; that the Company has not met the requirements of Section XXVII in maintaining pressure at 32 pounds, nor supplemental contract requirement of 40 pounds, and that in fires of any magnitude the pressure and water supply is insufficient, and that the supply is not ample for fire protection as required by Section IX, and that the Receiver, by the improvement of the pumping station, has greatly bettered conditions."

Complainant excepts to said finding as erroneous on the grounds and in the particulars hereinbefore stated, and prays that said finding may be changed and modified in accordance with the suggestions hereinbefore made.

Forty-first Exception.

Complainant excepts to the following finding of fact of said Master, being "Finding No. 12" in the summary of findings of fact in said report, and being on page 93 of the printed report, to-wit:

"With reference to the wholesomeness of the water as required by Section X, I have found that the reservoir water, when available is, under normal conditions, a wholesome water, but when the water is low it is not wholesome; that prior to July, 1902, the water
328 furnished by the Company was, with few exceptions, within the requirements of the contract, and in these exceptions the City has not availed itself of the provisions of Section XIII of the contract to correct impurities; that since July, 1902, the Company has not furnished a constant supply of wholesome water, nor has the Receiver been able to do so; that the Chattahoochee River can not be relied on as a constant source of supply for wholesome water, but only so when on a normal flow of the river, water is taken from points above, all possibility of contamination and properly filtered."

Complainant excepts to said finding as erroneous, on the grounds and in the particulars hereinbefore stated, and prays that said finding may be changed and modified in accordance with the suggestions hereinbefore made.

Forty-second Exception.

Complainant excepts to the following finding of fact of said Master, being "Finding No. 13" in the summary of findings of fact in said report, and being on page 93 of the printed report, to-wit:

"I have found that the purchasers of the Water Company in 1890 acquired the stock of the Company without consideration; that the property was acquired by the issue of half million dollars of bonds to the purchasers. Three hundred and twenty-five thousand ($325,000) dollars of which was the agreed valuation of the pro-

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perty, and was used by themselves in its purchase; that the price w
largely in excess of its actual value and that the syndicate wh
originally purchased these $325,000 of bonds knew, or had full o
portunity of knowing, this fact."

Complainant excepts to said finding as erroneous, on the groun
and in the particulars hereinbefore stated, and prays that said fin
ing may be changed and modified in accordance with th
329 suggestions hereinbefore made. Complainant excepts in pa
ticular to the following portion of said finding, to-wit: "Th
the price was largely in excess of its actual value, and that the sy
dicate who originally purchased these $325,000.00 of bonds kne
or had full opportunity of knowing this fact." Complainant excep
to this finding upon the grounds and in the particulars hereinbefo
set forth, and prays that said finding may be modified in accordan
with the suggestions hereinbefore contained.

Forty-third Exception.

Complainant excepts to the following finding of fact of said Ma
ter, being "Finding No. 15" in the summary of findings of fact
said report, and being on page 94 of the printed report, to-wit:

"That the Company has not been able for the want of availab
funds, to maintain and improve its system as the growth of the Ci
demanded, and that extensions since 1891 have, from time to tim
been, with the exception of a small amount, paid for by a necessa
increase of a bonded indebtedness originally out of proportion to th
earning capacity of the system, and constantly growing further b
yond the ability of the system to maintain; that the system h
not been reinforced and strengthened as its needs require, and th
the owners of the bonds of the Company recognized this fact."

Complainant excepts to said finding as erroneous on the groun
and in the particulars hereinbefore stated, and prays that said fin
ing may be changed and modified in accordance with the suggestio
hereinbefore made.

330 *Forty-fourth Exception.*

Complainant excepts to the following finding of fact of said Ma
ter, being "Finding No. 18" in the summary of findings of fact
said report, and being on page 95 of the printed report, to-wit:

"That the present estimated value of the available portion of th
system, with the river as a source of supply, is $176,562.62."

Complainant excepts to said finding as erroneous on the groun
and in the particulars hereinbefore stated, and prays that said fin
ing may be changed and modified in accordance with the suggestio
hereinbefore made. Complainant excepts to said estimate of valu
as incorrect and as excluding elements that ought to enter into th
same, as placing the value on an improper basis, and upon the va
ous other grounds hereinbefore specified in dealing with the fu
estimate, of which said last mentioned figures are the summary.

Forty-fifth Exception.

Complainant excepts to the finding of fact of the said Master appearing on page 115 of the printed report, which is in the following language, to-wit:

"I have found that the Water Company has failed in the several particulars as set out in the findings of fact in the performance of its undertakings to supply the City with an abundance of pure and wholesome water, amply sufficient for domestic uses and for protection against fire."

And in specification and support of this exception complainant refers to the grounds and specifications hereinbefore set forth
331 at large in connection with the detailed findings, of which said last mentioned finding is a summary, and complainant prays that said finding may be modified and corrected in conformity with the suggestions hereinbefore made.

Forty-sixth Exception.

Complainant excepts to the finding of fact of the said Master appearing on pages 115 and 116 of the report, and being in language following, to-wit:

"Under conditions existing at the time of the passage of the ordinance in September, 1902, and at the time of its practically unanimous ratification in December thereafter, and for a long period prior thereto, it was evident that the Water Company was not only unable to do so, but had failed to supply the needs of the City. The water was impure and deleterious to public health, and had been condemned both by the Board of Health and by chemists called upon to analyze it. The citizens were forced to purchase water for domestic use, and the fire protection was uncertain. In these conditions the City was justified in taking steps to provide for a different and adequate system of water works, and in the exercise of its police power had the legal right to do this."

Complainant excepts to said finding as erroneous in the particulars and upon the grounds hereinbefore set forth in connection with the specific findings of which said last mentioned finding is in part a summary; and complainant without repeating said grounds and specifications prays reference thereto as grounds and specifications of exception to the findings now here excepted to, and complainant further submits that the conditions existing at the time of the passage of the ordinance in September, 1902, were due to the
332 City's gross conduct in repudiating the contract, and in thereafter refusing to withdraw its repudiation or to recognize the existence of the contract, or to withdraw or depart from its gross conduct which had destroyed the ability of the Water Works Company to market its bonds, and largely crippled said Company, and which had placed said Company and its bondholders in a position where they could not with safety make investments of other large sums of money in bettering and extending the system, and could not in justice be called upon by the City so to do.

Complainant submits that the finding, that at the time and for a long period prior thereto, it was evident that the Water Company was unable to supply the needs of the City is contrary to the facts, and is further incomplete and misleading without the statement in connection therewith and as a part of said finding that the conditions existing in 1902 were attributable and chargeable to the City's own action in repudiating the contract, and in its course of conduct from 1893 up to and including 1902.

Complainant submits that the finding that at the time and for a long period of time prior thereto it was evident that the Water Company had failed to supply the City, is likewise erroneous for the reasons just stated.

Complainant denies that an emergency existed for the action on the part of the City inasmuch as the emergency was of the City's own making, and inasmuch as the drought was unprecedented, the conditions exceptional, and the City's conduct not only was not justified but the facts existing furnished no remedy, it appearing from the evidence that the Water Works Company as soon as the emergency arose promptly attempted to deal therewith, had em-
333 ployed expert engineers to make surveys, had arranged with its bondholders for the furnishing of the money necessary, had apprised the City of its intention, and that not only would it have remedied the evil if permitted so to do, but such remedy would have been both more efficient and more speedy that that proposed by the City.

Complainant further submits that for any such alleged conditions or failures, the contract furnished a remedy, and that the remedy furnished by the contract should have been followed.

For all of which reasons and upon all of which grounds, as well as for the reasons and upon the grounds hereinbefore set forth in connection with the particular findings of facts upon which the above summary and conclusion of law of the said Master is based, complainant excepts to said last mentioned finding and conclusion of fact, and complainant says that the Master erred in not finding in accordance with the suggestions hereinbefore set forth, and in accordance with the suggestions made to the said Master, in connection with the specific findings aforesaid.

Forty-seventh Exception.

Complainant excepts to the finding of fact of said Master, on page 117 of the printed report, which is as follows, to-wit:

"I do not think any action of the City prior to this time in any way on this question, affects the present case, and the reference in the ordinance to economical reasons was merely incidental."

334 Complainant excepts to said finding as erroneous in fact and erroneous in law, and complainant submits that from the evidence it should have been found by the Master that the action of the City prior to the time referred to brought about the conditions which the City undertook to deal with by the ordinance of 1902, and complainant further submits that the reference in the ordinance

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to economical reasons was not merely incidental, but was in continuation of the purpose which existed on the part of the governing body and a large portion of the citizens of the City of Columbus to break and repudiate the contract with the Water Company, going back to the time when it was believed to be possible to break said contract under the decision made by the Supreme Court of Georgia in August, 1892, in the Cartersville cases, and that in all resolutions the question of cost is made prominent and the economical reasons advanced were very largely influential in leading the City to determine upon and adhere to a purpose of repudiating and setting aside the contract and going to municipal ownership as soon as circumstances should render it possible to obtain the requisite popular vote; and that the City purposely and knowingly hampered and crippled the Company in its efforts to extend and better its system.

Forty-eighth Exception.

Complainant excepts to the finding of fact of the said Master on pages 117 and 118 of the printed report, which is in the language following, to-wit:

335 "The true reason underlying the attempted repudiation of this contract in the preceding years seems to have been popular discontent at the repeated inefficiency of the water works system, but, as has been shown, the citizens refused to endorse the efforts of its Council to repudiate its contract, and evinced by a popular vote its willingness to permit the Water Company further time in which to endeavor to carry out its contract."

Complainant excepts to said finding as erroneous and contrary to the evidence, and submits that it appears from the evidence that from the time of the completion of the settling reservoir, the Broad street standpipe, and the other extensive improvements in 1888, there was no complaint on the part of Council or the citizens to justify the finding that such was the reason; that in 1888 and 1889 the Council proceedings show that the water service was eminently satisfactory, and Council committee referred thereto in terms of high commendation; that the complaints which arose as to the water service was not from the Company's failure to comply with the contract, but was due to the fact that the City took no action for the extension of the water supply into the large portion of the City known as the "Annex," and for several years suffered that portion of the City to remain entirely without fire protection or water for domestic use, or to make any efforts to reach an arrangement with the Water Company looking to that end; that the Water Company at all times expressed itself as willing to enter into any fair arrangement for such extension, not only under the terms of the contract, but proposed to make any modification which might be just to both parties; that while the City's neglect to take action in this matter

336 was leading to dissatisfaction on the part of residents and property-owners in the new part of the City known as the "Annex," the Supreme Court of the State rendered a decision which led the City authorities to believe that they could repudiate

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the contract as invalid on constitutional grounds, and the City authorities seized hold of that fact to enter upon a plan of wrecking the system of water works instead of living up to its contract with the Water Company; that while it is true that the citizens at the different elections refused to authorize the issue of bonds for the erection of an independent system, yet Council never receded from its original purpose, but continuously refused to recognize the contract, as valid, and that no resolution is to be found from the time of the original repudiation up to the present in which Council has ever seen fit to withdraw said repudiation or recognize the validity of the contract, although earnestly requested so to do by the Water Company; and although on several occasions the Water Company agreed to make every improvement called for or desired by the City upon the condition only that the City on its part would recognize the contract as a permanent and binding contract, and undertake not to construct its own system as soon as the opportunity should offer.

Complainant submits that said finding is contrary to the evidence for the reasons above advanced, as well as the other reasons pointed out in connection with the other objections which complainant has heretofore made and to which reference is now had; and complainant prays that said finding may be modified so as to conform to the above suggestions.

337 *Forty-ninth Exception.*

Complainant excepts to the finding of fact of the said Master on page 118 of the printed report, which is as follows:

"The Council itself finally abandoned any effort at repudiation or abrogation, and on the contrary entered into a supplemental agreement, thereby signifying its willingness to give the Company further opportunity to perform its undertakings. The findings of fact show that the City had, at the time of the final failure, outgrown the water system, and that the Water Company was unable to meet the requirements of the City. This is virtually admitted in the foreclosure proceedings, the reason assigned being that the Company was without funds, and not only because of the City's action, but from other causes."

Complainant excepts to said finding as erroneous and as being contrary to the evidence, and complainant submits that it is not true that Council itself finally abandoned any effort at repudiation or abrogation. It does appear that Council was unable to procure the requisite two-thirds of the popular vote for the issue of bonds for the building of an independent system, but the resolutions of Council immediately after each of said elections continued to assert the City's claim of right to build a system of its own, and continued to assert that the contract between the City and the Water Company was not binding except at the City's pleasure, and refused, when appealed to, to recognize its obligation, or to recede from its position denying its validity. The continuing to receive the benefits of the contract while denying its binding force except during the City's

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pleasure, did not remove the Water Company's inability to market its bonds.

338 The Council entered into a supplemental agreement for extension of the Water Works into the "Annex," and under said supplemental agreement a large sum of money was expended by the Water Company, and the Company, at great expense of operation, converted its system from a gravity into a pumping system, thereby greatly bettering the conditions and increasing the pressure far beyond the requirements of the contract. This was done, however, without any admission on the City's part that the contract was binding for thirty years, that it extended over or longer than it should remain the City's pleasure to accept water at the rates named therein. The City not only did not recede from its former position, but was at all times careful not to make complaint in the manner provided in the contract, or to do any act recognizing the binding force of the contract, but only recognized, under the decision of the Supreme Court of Georgia in the Cartersville case, its obligations to pay for the water at the price fixed by the contract as long as it should see fit to receive it, thus placing the Company in a position where it could not longer with safety to itself or its bondholders make any extensive changes or betterments, and where its power to market the bonds necessary for any extensive system of improvements was utterly cut off and destroyed.

Complainant submits that the foreclosure proceeding did not virtually admit the inability of the Water Company to carry out the provisions of its contract, but on the contrary complainant insists that the foreclosure proceedings showed that the Company's inability to make the desired extensions and improvements and to meet existing conditions was due to the City's act in repudiating the contract and destroying its credit.

339 Wherefore, complainant excepts to the said finding and to the refusal of the Master to find in accordance with the suggestions made to him by complainant and which are hereinbefore set forth.

Fiftieth Exception.

Complainant excepts to the finding of fact of the said Master on page 120 of the printed report, which is in the following language, to-wit:

"The facts in this controversy are found to be that both the Company and the City knew that the water was not only unwholesome, but had entirely failed in September, 1902, and that for several months thereafter, and before the ratification of the ordinance, river water, equally unwholesome and unfit for use, had to be resorted to. It was evident that 'a sudden emergency' had arisen requiring immediate action."

Complainant excepts to said finding as erroneous and as contrary to the evidence, and complainant submits that under the provisions of Section 13 of the contract the duty existed on the part of the City not only to call upon experts to ascertain whether the water had become unwholesome, but further that it was the City's duty to give

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notice to the Company that the Company should adopt a new source of supply, or otherwise take the necessary steps to correct the conditions; and further that the duty was upon the City to give a reasonable time within which to correct such evil after notice given, and that the Company was entitled to the judgment of the experts not only as to the existence of the unwholesomeness but as to the remedies proper to be adopted to remove the same, and the time within which such removal should be made; and further
340 that Section 13 of the contract prescribes the remedy to be adopted by the City in the event of the Water Company's failure so to do.

Complainant submits that the Water Company was entitled to a recognition by the City of the binding force of the contract such as the Water Company would have had, had the City resorted to Section 19 of the contract, or otherwise proceeded under the contract, and not utterly ignored the contract, as the City saw fit constantly to do since the original repudiation in 1894.

Complainant submits that no act is to be found on the part of the City subsequent to the original repudiation in 1894 that does not studiously refrain from doing anything inconsistent with the City's attitude that there was no permanent and valid contract or obligation upon the City except to pay for the water so long as it should be its pleasure to receive the same.

Complainant insists that a sudden emergency had not arisen justifying the abrogation of the contract, inasmuch as the City had brought the emergency about by its own conduct in repudiating the contract, and inasmuch as the provisions of the contract were entirely adequate for dealing with an emergency had such provisions been resorted to, or had the City seen fit to recognize the validity of the contract.

Complainant insists that the ordinance of 1892, relied upon as the exercise of the police power, studiously refrained from recognizing the validity of the contract of 1882; and that the City's omission to make the complaint or proceed under the contract was deliberate and intentional and a part of its consistent course
341 of conduct to repudiate the contract, and to receive water from the Company only at its pleasure, and not in recognition of its obligation to do so under the contract.

Wherefore complainant excepts to the said finding and excepts to the refusal of the Master to find in accordance with the suggestions made to him by complainant, and which are hereinbefore set forth.

Fifty-first Exception.

Complainant excepts to the finding of fact of the said Master on page 120 of the printed report, to-wit: Speaking of the action of the City in calling an election for the issue of bonds to build water works in 1902, and which the Master refers to an exercise of its police power that "the step taken by the City was not unreasonable."

Complainant excepts to said finding as erroneous in fact and erroneous in law, and complainant submits that for the reasons

hereinbefore stated, and particularly by reason of the facts stated in connection with the last preceding exception (Exception 50), the City's conduct was unreasonable and in utter disregard of the rights of the Water Works Company and its bondholders.

Fifty-second Exception.

Complainant excepts to the finding of the said Master contained on page 121 of the printed report, which is as follows, to-wit:

342 "I conclude that from the facts in the case at bar the City had a right, in the exercise of its high duty of protecting the health of the inhabitants of the City, to take such steps as it saw proper to provide means to supply to the people wholesome and abundant water, and could therefore enact the ordinance here sought to be set aside, subject, however, to a proper adjudication of the contract rights of those affected by the exercise of the power."

Complainant excepts to said finding and conclusion of the Master as erroneous in fact and erroneous in law. Complainant submits that so far as the same is a finding in fact, that said finding is erroneous and contrary to the facts established by the evidence in said case, for the reasons hereinbefore set out in detail in the different objections to the specific findings upon which the present conclusion is based, and complainant submits that as a conclusion of law drawn from the facts, the said finding and conclusion is erroneous as a matter of law.

Complainant submits that the contract prescribes the method in which the City should proceed, and that the City could not thus ignore and reject the provisions of the contract intended for the protection of the Water Works Company, and further that the City could not by its repudiation of its obligation bring about a situation injurious alike to the Water Works Company and the City, and then upon the plea of exercising the duty to protect the health of the inhabitants of the City, destroy the rights and property of the Water Works Company, by reason of an emergency for which the City itself was responsible.

343 *Fifty-third Exception.*

Complainant excepts to the finding of fact and conclusion of the Master upon the subject of the acceptance of the Water Works by the City and construction in compliance with the contract in 1882, which finding appears on page 122 of the printed report, and in the language following, to-wit:

"I have found that this acceptance was made on the assurances by the Water Company that the works were so constructed as to carry out the purposes intended and that the Company would comply fully with all of its terms. This the Company has failed to do in many particulars as found by the facts, but notably in failure to construct and keep the reservoirs as required, to add additional supply or sources of supply; to supply pipes sufficient to afford required

pressure at all times, and to properly connect its mains; to provide a proper filter and sufficient supply mains; to at all times afford wholesome and abundant water. The Company was not excused in the performance of these undertakings by the conditional acceptance of the system by the City, nor because of complaints of the people, or the Council, or from unusual droughts, or because of want of funds.

"The course of the City has been forbearing and generous towards the Water Company. The contract was an entire one, and was not executed by a partial performance as to one of the several undertakings on the part of Shelton (White in the instant case) and his assigns; and they assumed all the risk of obtaining a water supply sufficient in quantity and quality to comply with their contract."

Complainant excepts to said finding as erroneous and contrary to the facts as established by the evidence; and complainant submits that as shown by the evidence and as the Master should have found, that the acceptance was made on the assurances by the Water Company that the works were so constructed as to carry out the
344 purposes intended, is erroneous for the reasons hereinbefore set forth in connection with the finding of which the present is a repetition.

Complainant submits that the City at the time of accepting the Water Works was represented by a special committee upon which was an engineering expert who was thoroughly competent and of well known ability; that the works were constructed according to specifications, except where the City and its committee saw fit to modify the original specifications for the sake of other compensating or greater advantages; that the manner in which the system was constructed was prescribed by contract, the City well knew exactly what it was getting, and did not rely or have any right to rely upon any assurances by the Water Company, but relied instead upon specifications and requirements carefully planned and adopted by itself after a consideration and study of the subject extending over several years, after conferences with other contractors, after attempting to make other contracts, and with the full assistance of engineering experts of the highest character and ability.

Complainant submits that the finding that the acceptance was made on the assurances that the Company would comply fully with all of the terms of its contract, is incomplete without also finding in connection therewith that by the cross obligations of the contract the City was required to point out in the manner specified in the contract any alleged deficiencies, and that the existence of such deficiencies was to be ascertained under the tests and in the manner provided in the contract and not otherwise, and that the Company was to have the opportunity to remedy the same after notice
345 as prescribed in the contract, and that the penalties for any failure were to be such as the contract prescribed, and that the City could not repudiate its cross obligations and deprive the Company of the protection given it by the contract.

Complainant submits that the finding that the Company has failed to comply with the contract in many particulars, and in the

particulars therein enumerated, is not correct, but should be corrected and modified as pointed out in the suggestions hereinbefore made in connection with the objections dealing with the findings repeated and grouped together as the basis of the present conclusion.

Complainant submits that the finding that the course of the City has been forbearing and generous towards the Water Company is utterly unsupported by the evidence, but is directly opposed to the facts as shown by the entire evidence, it appearing that at the time when the Water Works Company was fully complying with its contract, the City, without proceeding in the manner required by the contract, and without notice of the alleged defects, repudiated the contract, not on the ground of any defects or alleged defects, but on the ground that it was invalid by reason of not having been submitted to popular vote, and that many years after the Company had operated thereunder and had paid out many thousands of dollars in putting itself in a position to carry out (and in carrying out) said contract; that at no time has the City made complaints or given notice of defects, as provided in the contract, or given the Company an opportunity to remedy alleged defects, but on the contrary, by its acts in repudiating the contract, by unreasonable demands far
in excess of the requirements of the contract, by refusing to
346 treat with the Company, or even state what it wishes the Company to do, has crippled the Company and destroyed its ability to market its bonds, and brought about the deplorable conditions which existed in 1902, which were due to the City's own act, and which the City, by its act, rendered the Company unable to avert.

Complainant insists that the language quoted from the Galesburg case is utterly inapplicable to the case at bar, the facts of that case and the case at bar being entirely different.

Whereupon complainant excepts to the said finding and excepts to the refusal of the Master to find in accordance with the suggestions made to him by complainant, and which are hereinbefore set forth.

Fifty-fourth Exception.

Complainant excepts to the finding of the said Master on page 123 of the printed report, which is as follows, to-wit:

"On the contrary the City has, from time to time, at frequent intervals, protested against the character of the service and the efficiency of the system and brought its protest to the attention of the Company, and has given the Company every opportunity and reasonable time to test its ability to carry out the contract. It has been found, as a matter of fact, that the Company was unable to carry out the provisions of the contract, and for causes not arising altogether, at least, from the conduct of the City."

Complainant excepts to said finding as erroneous and contrary
to the evidence, and complainant for grounds and specifica-
347 tions of objection refers to the specifications of objection hereinbefore set forth in connection with the preceding exceptions, and complainant submits that it is not shown by the evidence

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that the City has from time to time, at frequent intervals, protested against the character of service and efficiency of the system and brought its protests to the attention of the Company. Complainant insists that there have been no complaints in the manner that the contract requires. Complainant insists that such complaints as were made were not that the system failed to comply with its contract, but that the City made requirements largely in excess of the requirements of the contract, and utterly unreasonable and impossible to fulfill. That after earnestly insisting on having formal complaints made if any defects existed, and an opportunity to know what the City's complaint was and to remedy the same, and that it asked the City, time and time again what would satisfy the City, and offered to make improvements far in excess of the requirements of the contract; that it agreed, after the City pointed out what was desired, to meet every requirement and every recommendation or request which the City saw fit to make, upon condition only that the City recognize the validity and permanence of the contract, and agree to accept and carry the contract out and be bound thereby.

Complainant submits that it is not true that the City has given the Company every opportunity and reasonable time to test its ability to carry out the contract, but on the contrary has thrown every obstacle in the way, and by repudiating the contract has crippled the Company and destroyed its ability to market its bonds.

348 Complainant submits that it is not true that the Company was unable to carry out the provisions of the contract, but on the contrary insists that it is shown by the evidence that it was amply able to have carried out the provisions of the contract, and would have extended and bettered the system beyond the contract requirements if permitted so to do by the City, and if the City had not persisted in its course of repudiation of the contract, and had not by such repudiation crippled the credit of the Company and destroyed its ability to market its bonds.

Wherefore, complainant excepts to the said finding and excepts to the refusal of the Master to find in accordance with the suggestions made to him by complainant and which are hereinbefore set forth, and complainant having requested that the Master, in lieu of the general finding complained about, set forth specifically what opportunity was given the Company to carry out the contract, what particular protests were made and the nature thereof, so that it may appear how far the same were based upon the contract, and how far the same consist of requirements not in said contract, and whether or not said several requirements were made by the City while recognizing the validity of the contract, or whether on the other hand the City did not accompany its demands with the statement that the contract was invalid, and that even if the proposed changes were met, the City would not hold itself bound to carry out the contract except during its pleasure. Complainant now excepts to the refusal of the Master to make said specific findings as requested, and complainant submits that it is complainant's right to have an ex-

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plicit and specific statement of any instances in which the
349 City actually made protest as to any faults, and about the opportunity offered the Company for remedying the same, in order that the Court may have the necessary facts before it in order to apply the law to the facts of the case.

Fifty-fifth Exception.

Complainant excepts to the finding and conclusion of the said Master on page 124 of the printed record, which is as follows, to-wit: "I therefore conclude that the conditional acceptance of this system by the City in 1882, and its continued acceptance of service since that time, does not now estop it from seeking affirmative relief as set up in its cross bill. As before stated, the Water Company has, by its own admissions, shown its inability to maintain and operate the works and from causes not wholly chargeable to the conduct of the City."

Complainant excepts to said finding and conclusion as erroneous in fact and erroneous in law. Complainant excepts specifically and particularly to the last sentence, to-wit: "I find that the Water Company has, by its own admissions, shown its inability to maintain and operate the works and from causes not wholly chargeable to the conduct of the City."

Complainant submits that said finding is contrary to the evidence, and is erroneous for the reasons hereinbefore pointed out in connection with the preceding exceptions to similar findings in a previous part of the report, and complainant further submits that said finding is erroneous in law.

350 *Fifty-sixth Exception.*

Complainant excepts to the finding and conclusion of the Master on page 125 of the printed report, with reference to the contentions of complainant that there were reciprocal obligations on the City, as provided in the contract, which should have been complied with on the City's part before the City was entitled to demand an abrogation or forfeiture of the contract, and that the City, not having established the existence of defects and made complaint thereof, as provided by the contract, was not in a position to urge the insistence that the system is inadequate or that defects existed, such as would entitle the City to declare a forfeiture.

That the facts as here found do not sustain the contention, and it may be stated in general terms, that the continued default and inability of the Water Company relieved the City from its reciprocal obligations.

Complainant excepts to said general finding and conclusion as erroneous and contrary to the evidence. Complainant submits that, as hereinbefore pointed out, in connection with the exceptions to the specific findings of fact upon which said general conclusion is based, the City never proceeded as required by the contract to estab-

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lish the existence of defects, or to place upon the Company a
obligation which it has failed to perform; that the contract mak
explicit provision as to the manner in which it shall be ascertain
whether defects of service, insufficiency of pressure, contaminati
of water, or other defects or insufficiencies exist, and that under t
obligations resting upon the City, the City was required to p
ceed in accordance with the provisions of the contract
351 the event it was claimed that such defects existed, and th
there was no continued default or inability of the Wat
Company, and that the City was not relieved of its reciprocal oblig
tions. On the contrary, complainant submits that, as shown
the evidence, the Water Works Company, in its communicatio
with the City, insisted that if there were defects the same should
pointed out, and that the City should make known to it in wh
particulars, if any, it was claimed that the Company failed to co
ply with its contract, and that the City, so far from complaining
any failure to comply with the contract, made demands upon t
Water Company far in excess of the requirements of the contra
and without regard to the requirements thereof, and that the Co
pany agreed to meet these additional demands and requireme
upon condition only that the City, on its part, would recognize t
validity of the contract; and that the City refused so to do; and
appears, too, that the City never at any time proceeded under the co
tract or gave the Company the notice the contract called for, a
complainant further submits that the said finding is contrary to t
evidence for the reasons and upon the grounds hereinbefore fu
set forth in connection with the preceding exceptions, and in su
port of this exception complainant cites Volume I of the eviden
pages 313 to 328, pages 415, 416, 417, pages 424, 425, 426, 4
428, 429, pages 429 to 432, pages 436 to 439, pages 439 to 4
pages 440 to 445.

For all of which reasons, as well as for the reasons hereinbefo
stated in connection with said preceding exceptions, complaina
submits that said finding and conclusion is erroneous.

352 *Fifty-seventh Exception.*

Complainant excepts to the finding of the Master on page 1
of the printed report, which is as follows, to-wit:

"That the Company has failed to supply the City with wa
under the terms of the contract is abundantly shown by the e
dence, and this is especially true since July, 1902, and, as here
before referred to, it has admitted its inability and placed the
sponsibility of further undertaking to carry out the contract up
the holders of the bonds of the Company."

Complainant insists that this finding, and each of the seve
findings embraced therein, is erroneous, against the evidence, a
not sustained by the evidence. And for a specific statement of co
plainant's grounds of exception thereto, complainant refers to
specifications and grounds hereinbefore urged in connection w
similar findings of the Master hereinbefore excepted to.

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Fifty-eighth Exception.

Complainant excepts to the finding of the Master touching the estimated value of the distribution system, as stated in the printed report on pages 126 and 127 thereof, said finding being as follows:

"I have found the estimated values of the distribution system, with the river as a source of supply, to be $176,562.62. These figures are ascertained from the evidence of cost of reproduction at a certain stated time and value of betterments added since that time. There was no inventory in evidence and the Company failed to show values of the property except in a general way. I have, in reaching this value, followed the rule for valuation of water works systems as defined by Mr. Justice Brewer, sitting as Circuit
353 Judge in the case of National Water Works Company *vs.* Kansas City, 62 Fed. 864; 10 C. C. A. 653; 27 L. R. A. 827.

"'The fair and equitable value of the works (the water works system in that case) should not be determined by capitalization of the earnings * * * nor should such value be limited to the cost of reproducing the plant, but allowances should be made for the additional value created by the fact of connections with and supply of buildings. See also Gloucester *vs.* Gloucester, 179 Mass. 365; 60 N. E. 977.'

"Following this rule and applying the evidence of values as shown in the findings of fact, I have based the estimate of value on what would be the cost of reproducing the distribution system, that is the part lying in the City of Columbus, and have added ten per cent. as the value of present connections or for what may be termed the going concern. In arriving at the valuation above named I eliminated, as will be seen in the findings of facts, all consideration of the property of the system lying in Alabama and of the 4-inch mains. While these 4-inch mains may have been laid at the instance of the City authorities as being the cheapest under Section 28 of the contract, this did not relieve the Company from connecting together these mains at close intervals and eliminating dead ends. This section must be read in connection with Section XL of the contract in which the Company obligated itself to so construct the system as to admit of enlargement without remodeling or altering the street mains for many years to come. The evidence, it will be remembered, shows that since 1895 the Company, of its own accord, ceased to lay any more of these 4-inch mains."

Complainant excepts to said finding as erroneous in fact and erroneous in law.

Complainant submits that said estimated value was arrived at upon an erroneous theory and basis of calculation, and could only be reached by excluding numerous elements of value, and disregarding the testimony of witnesses based upon these elements of
354 value, as hereinbefore set forth in connection with the preceding objections touching the subject of the valuation of said property. Complainant submits that said finding is erroneous upon the several grounds and specifications there stated and urged.

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Complainant further submits that said finding is erroneous
excluding from calculation the value and all consideration of t
4-inch mains, for the reasons hereinbefore stated. Complainant i
sists that the finding that the Company was under obligation to co
nect together these 4-inch mains at close intervals and elimina
dead ends, is error under the testimony in the case; it appearing th
the original contract was approved by the City, that these 4-in
mains were laid by the consent and with the knowledge and approv
of the City, that the Company was never at any time called upon
connect up the dead ends or to make other connections; that neith
the dead ends nor the 4-inch mains were ever shown to be of insu
cient capacity in the manner which the contract provides for asc
taining when the mains were to be deemed to be of insufficie
capacity. That it appears from the evidence that said 4-inch mai
reached a portion of the City where the buildings are in the ma
low, small one-story buildings, and it further appears from the e
dence that under the proposed changes recommended by A.
Boardman, by which larger pipes would intersect the 4-inch mai
at frequent intervals, the 4-inch mains would give efficient and sa
factory service, and would furnish adequate pressure, and it wou
be a needless waste to discard the smaller mains when they cou
be utilized as laterals, and form a valuable component p
355 of an excellent distribution system.

Wherefore upon the grounds above stated, and the oth
grounds and specifications hereinbefore set out under objections
lating to the findings of the Master upon the same subject, co
plainant says that the above finding is erroneous, and that the Mas
erred in not finding in accordance with said suggestions.

Fifty-ninth Exception.

Complainant excepts to the finding of the Master appearing
pages 127 and 128 of the printed report, which is in the langua
following, to-wit:

"The proposition of the complainant is that 'the bondholders
permitted to undertake to carry out the contract and with the aid
the Court, in this undertaking, to perform all obligations which w
originally assumed by the Water Company.' The Water Compa
concurs in the request. The evidence discloses that in order to und
take to do this it will be necessary for them to resort to the Cha
hoochee River as a permanent source of supply. A careful read
of the contract will disclose that it was never the intention of
parties that the river should be used as a source of supply."

Complainant excepts to said finding as erroneous, and in parti
lar excepts to the construction placed by the Master upon the c
tract, and the conclusion drawn by him, that it was not the intent
of the contract that the river should never be used as a source
supply.

Complainant insists that the evidence does not disclose that
would be necessary for complainant to resort to the Chattahooc

River as a permanent source of supply, any more than it
356 would be necessary for the City to resort to the same source for a supply, but on the contrary it appears from the evidence that any source to which the City could resort could also be resorted to by the complainant.

Complainant submits that the City cannot adopt the attitude of suggesting objections to the source which complainant believes to be the most practicable, and itself refuse to make any counter-suggestions as to what it deems to be the proper, or to point out any available, source of supply, and by refusing to make such suggestions, deprive complainant of the benefit of complainant's offer to give the City wholesome water in abundant quantities from such source or sources as, upon the hearing of the case or upon any proper mode of determination, should be found most practicable and desirable. Complainant insists that the burden is upon the City, if dissatisfied with the source suggested by complainant, to suggest what other source or sources would be satisfactory or practicable, and that the City cannot be permitted to occupy the attitude of urging that the complainant be required to do the impossible, or of declining the benefit of the broad offer made by complainant, which was not limited to any source of water whatsoever, complainant having offered during the hearing when testimony was being taken, and also during the argument, and upon the coming in of the draft report, and now offering to furnish water from such sources as would best afford at all times an abundant supply of wholesome water, and having called upon defendant to make its own investigation, and state what sources of supply it de-
sires and deems most practicable, and to show the same to be
357 such by evidence satisfactory to the Court.

Complainant submits that there is nothing in the contract to indicate that it was the intention of the parties that the river should not be used as a source of supply. On the contrary, the only provision in the contract is that the Water Company shall furnish wholesome water in ample quantity, and that whenever the City questions the wholesomeness of the water furnished and *gave* due notice thereof, the matter should be referred to experts; and it was not in the contemplation of the contract that the Company should do the impossible, or should do more than furnish the City wholesome water from the best source or sources that the same could be obtained from in sufficient quantity. Complainant insists that the testimony shows that the distribution system is adapted for furnishing water to the city from any sources that may exist, and that the City, not less than the complainant, is called upon to offer evidence as to what is the best source from which wholesome water in sufficient quantities is obtainable.

And complainant, having requested that the Master find as above outlined, excepts to the refusal of the Master to find as so requested, and excepts to the finding made by the Master as erroneous upon the grounds and for the reasons.

Sixtieth Exception.

Complainant excepts to the Master's finding of fact on pages 128 and 129 of the printed report, as follows:

"It was contended by counsel for the defendants that the contract was to be construed to limiting the grantee to the source of
358 supply selected and by the system adopted. Whether or not the contract is to be construed as limited to this particular source of supply, it is very evident that it was never in the mind of the contracting parties that the river should be adopted or ever used as a source of supply. If this must be done, the responsibility of adopting this source, which is at least a doubtful expediency, should rest on the City, and not be assumed by the bondholders under permission of the Court. The Court will not undertake to make a new contract between the parties or the creditors of either."

Complainant excepts to said finding as erroneous, and as being contrary to the evidence.

Complainant submits that said finding is erroneous in law and in fact. Complainant submits that the contract does not limit the grantee to any source of supply, but on the contrary leaves the source of supply to be selected and from time to time changed by the Water Company, and fixes the extent of the City's rights in the matter as being that the City shall have wholesome water, and provides the method in which the question of wholesomeness shall be raised, and the manner in which it shall be determined. Complainant submits that there is nothing in the contract to exclude the river as a source of supply, and while the science of filtration had not, at that time, reached the stage to make the use of river water desirable at that time, there is nothing in the contract which in the slightest degree limits or restrains the right to use such water, provided only that the same be wholesome, and the contract puts the risk of its continued wholesomeness upon the Water Company by providing that whenever the water from any source whatever should become unwholesome, after notice from the City,
359 the matter should be inquired into by experts, and if condemned, the Company should remove the cause of trouble, or procure a new source of supply in a reasonable time, to be fixed by the decision of the experts.

Wherefore complainant excepts to said finding and excepts to the Master's refusal to find in accordance with complainant's objections heretofore made to him as hereinbefore set forth.

Sixty-first Exception.

Complainant excepts to the Master's finding of fact contained on page 131 of the printed report as follows:

"That the holders of the bonds of the Columbus Water Works Company have no greater legal right than the Company to a continuance of the present contract, and the Company having failed to perform its conditions, and the City being entitled to a cancella-

tion thereof as against the Company, it has a similar right against the bondholders who have no legal right to a continuance of the contract for their benefit."

Complainant excepts to said finding as erroneous, and as being contrary to the evidence.

Complainant submits that in view of the fact that the issuance of bonds by the Water Company was contemplated by the City and authorized by the contract, and a feature embodied in the contract intended to make said bonds desirable, and to attract purchasers therefor, that the City is in equity and good conscience under obligations, not by its course of conduct to destroy the property which furnished the bondholders their security, without notice to the bond-
360 holders, or their trustee, and further that under the facts stated in the bill and shown by the evidence, the bondholders have against the City their independent equity, and have rights different from and greater than those possessed by the Company. Complainant submits that even if the Company by its conduct had forfeited any rights, the same is not true of bondholders, who have at all times relied upon the City's assurances contained in the Water Works contract that their rights and security would be respected, and that the City would not, without notice to them, undertake to confiscate their rights and the property which forms the basis of their security. Complainant submits that it is not true that the Company has failed to perform its conditions or that the facts entitle the City to a cancellation of the contract as against the Company. Complainant submits that even if such right exists against the Company, the City would not have such right against the bondholders, under the facts as shown by the evidence.

Wherefore complainant excepts to said finding, and excepts to the Master's refusal to find in accordance with complainant's suggestions heretofore made to him as hereinabove set forth.

Sixty-second Exception.

Complainant excepts to the Master's finding of facts on page 131 of the printed report as follows:

"That the City of Columbus is entitled to have said contract rescinded, and declared set aside and annulled, and that it should be permitted to carry out the purposes of the ordinance of
361 September 14, 1902, for the construction and operation of a system of water works."

Complainant objects to said finding as erroneous and as being contrary to the evidence.

Complainant submits that said finding is erroneous, in facts, for the reasons and for the grounds set forth in the preceding objections. Complainant submits that said finding and conclusion is erroneous in law, and complainant having in the oral argument and in a lengthy and elaborate brief filed with the Master by complainant's counsel set forth its contentions in this regard, deems it un-

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necessary at this place to do more than refer to the contentions there urged, and the grounds and reasons urged in support thereof.

Wherefore complainant excepts to said finding.

Sixty-third Exception.

Complainant excepts to the Master's finding of fact on page 131 of the printed report, as follows:

"That the Water Company is not entitled to the enforcement of the specific performance of its contract, nor of the validation thereof, nor to an injunction against the City carrying out the purposes of its ordinance."

Complainant excepts to said finding as erroneous, and as being contrary to the evidence.

Complainant submits that said finding is erroneous as a finding of fact, and as not being based upon the facts in said case established and shown by the evidence, and in support and specification of the grounds of this objection, and as fully setting forth said
362 objection, complainant refers to its foregoing exceptions and the specifications and grounds stated in connection therewith, and in support thereof.

Complainant submits that said finding is erroneous in law. Complainant having heretofore by oral argument and in a lengthy written argument, filed with the Master, set forth its contentions of law elaborately and fully, complainant deems it unnecessary at this point to do more than refer to the contentions there urged and there set forth.

Wherefore complainant excepts to said finding for the reasons heretofore set forth.

Sixty-fourth Exception.

Complainant excepts to the Master's finding of fact on page 133 of the printed report, as follows:

"There is no analogy in the case at bar and the foregoing cases on the points, as I have stated them. It was contended that the City of Columbus, by the resolution of October, 1894, repudiated the present contract. But voters refused to ratify this, and that resolution in effect was only a protest. Subsequently the Water Company and the City recognized the existing contract by supplementing it with an agreement as to the annex, and the Water Company was again given an opportunity to test its ability to carry out the contract."

Complainant excepts to said finding as erroneous and as being contrary to the evidence.

Complainant submits that this finding is error. Complainant submits that the resolutions of October, 1894, and other resolutions of the City Council to the same effect, constituted and were a
363 repudiation by the City of its contract, and the action of the voters in refusing to authorize the issuance of bonds to build a new system did not withdraw or break the force of said repudiation,

or relieve the Water Company of the ill effects flowing therefrom; that after being thereby deprived of its ability to build a water works system of its own, the City fell back upon the contention that the contract with the Water Company was only good and valid during the City's pleasure as a contract from year to year, under the decision in the cases above referred to, and from that time to the present has carefully refrained from doing any act or passing any resolution recognizing the continued validity and binding force of said contract further than as a contract from year to year, terminable at the City's pleasure, and only binding the City to pay for the water received so long as the City should see fit to accept it.

Complainant denies that the supplemental contract did have, or was intended by the City to have, the effect of a recognition of the validity of the original contract, but the City's entire course of conduct proceeded upon the theory that whenever it got ready it could cease to continue to receive the water provided by the contract and furnished by the Company. Complainant submits that the City's conduct in thus repudiating the contract destroyed the Company's credit, depriving bondholders of the right and power to sell their bonds, destroyed the value of the property which furnished security for their bonds; in the mean time enjoying the privilege and benefit of fire protection and water for the use of its citizens, while repudiating the contract and waiting for a convenient season to erect water works of its own, is contrary to equity and good conscience,
364 and that the City ought not to be permitted, under the facts established by the evidence, to declare a forfeiture and cause a destruction of the property and property rights of the Water Company and of the bondholders.

Wherefore, complainant excepts to said finding and excepts to the Master's refusal to find in accordance with complainant's suggestions heretofore made to him as hereinabove set forth.

Sixty-fifth Exception.

Complainant excepts to the Master's finding of fact on page 136 of the printed report, as follows:

"While the City is entitled to a recision of the contract and may proceed to construct her own water system, etc."

Complainant as specification of the grounds of this exception refers to its foregoing exception and the grounds and specifications there stated.

Sixty-sixth Exception.

Complainant excepts to the Master's finding of fact on page 137 of the printed report, as follows:

"I have found that the portions lying in the State of Alabama are of no practical value. The valuation I have found is applicable only in case the river is to be used as a source of supply, and I have found that this was not in the mind of the parties when the contract was entered into."

Complainant excepts to said finding as erroneous, and as being contrary to the evidence.

365 Complainant submits that the finding that the portion of said system in the State of Alabama is of no practical value is erroneous—contrary to the facts. Complainant submits that the valuation of said system at $176,652.62 is erroneous and far less than the value of said system on a true and correct basis of valuation as hereinbefore shown, and complainant has set forth specifically the grounds of complainant's exception to the valuation hereinbefore, and now again refers to said exception and the specifications and grounds thereof.

Wherefore, complainant excepts to said finding of the Master for the reasons heretofore shown.

Sixty-seventh Exception.

Complainant excepts to the Master's finding of fact on page 139 of the printed report, as follows:

"That the affirmative relief as prayed for in the cross bill of the City be granted, and that the City be allowed, after the deposit of the aforesaid amount, to proceed to carry out the purposes of the ordinance providing for its water works system."

Complainant excepts to said finding and recommendation as unjustified and erroneous and as being contrary to the evidence.

Complainant submits that said finding and recommendation is not sustained by the facts, and is erroneous under the facts of the case as shown by the evidence. Complainant submits that said finding or recommendation is erroneous in law, and contrary to law and equity and good conscience. And for as much as complainant has hereinbefore set forth its exceptions to the various findings of fact

366 upon which said conclusion is based, and for as much as complainant has, in the argument of its counsel and in the written argument filed with the Master, set forth complainant's contentions of law, complainant deems it unnecessary at this point further to elaborate this exception.

Sixty-eighth Exception.

Complainant excepts to the following recommendations and finding contained on page 140 of the printed report, to-wit:

"That the indebtedness of the City to the Water Company of $2,530.82 withheld for water rentals, due October 1, 1902, be reduced by one-third, inasmuch as the City received no benefits of the water for domestic purposes during that period, and that the City be required to pay the balance to the Receiver."

Complainant submits that said finding, or recommendation, is not sustained by the facts, and is erroneous and unwarranted under the facts of the case as shown by the evidence.

Sixty-ninth Exception.

Complainant excepts to so much of the recommendation and "Finding No. 8," on page 140 of the printed report, as recommends and finds that in any possible event the bill of complaint be dismissed and the City be permitted to carry out the purposes of its ordinance of September, 1902, and all costs be taxed against
367 complainant. Complainant submits that said finding or recommendation is contrary to the evidence in said case, and is contrary to the law, and is contrary to the principles of equity and good conscience.

EXCEPTIONS TO CONCLUSIONS OF LAW.

Seventieth Exception.

Complainant excepts to the following finding and conclusion of law on page 104 of the printed report, to wit:

"The character of the City of Columbus not giving the right, and the State not having either directly or indirectly confirmed the grant, I conclude that the City of Columbus, at the date of the contract with the Columbus Water Works Company, had no power to grant to said Company an exclusive franchise for the construction and operation of a water works system, and that any attempt on the part of the City to make such a grant was *ultra vires*."

Seventy-first Exception.

Complainant excepts to the following finding and conclusion of law on page 117 of the printed report, as follows, to-wit:

"The conditions as shown to exist in the findings of fact herein set out have led me to the conclusion that the enactment of the ordinance was, under the rulings as herein cited, clearly within the exercise of the police power of the City, and not only justifiable but imperative."

368 *Seventy-second Exception.*

Complainant excepts to the following finding and conclusion of law on page 117 of the printed report:

"I do not think any action of the City prior to this time in any way on this question affects the present case, and the reference in the ordinance to economical reasons was merely incidental."

Seventy-third Exception.

Complainant excepts to the following finding and conclusion of law on page 118 of the printed report, to-wit:

"Clearly the City had the right, in the exercise of the duty it owed in protecting the welfare of the citizens, to take immediate steps under existing conditions to supply the inhabitants with water."

Seventy-fourth Exception.

Complainant excepts to the following finding and conclusion of law on page 120 of the printed report, to-wit:

"It is true that in the present contract provision is made by Section 13 for experts to be appointed to test the quality of the water should the same become unwholesome, and if so found, the City could order its use either limited or cut off, and it is contended that under this provision the City could take no steps to protect its citizens against unwholesome water until this was done. This provision was to enable the contracting parties to determine a question which might be in doubt."

369 *Seventy-fifth Exception.*

Complainant excepts to the following finding and conclusion of law on page 121 of the printed report, to wit:

"I conclude that, from the facts in the case at bar, the City had a right, in the exercise of its high duty of protecting the health of the inhabitants of the City, to take such steps as it saw proper to provide means to supply the people wholesome and abundant water, and could, therefore, enact the ordinance here sought to be set aside, subject, however, to a proper adjudication of the contract rights of those affected by the exercise of the power."

Seventy-sixth Exception.

Complainant excepts to the following finding and conclusion of law on page 124 of the printed report, to-wit:

"I, therefore, conclude that the conditional acceptance of this system by the City in 1882, and its continued acceptance of service since that time, does not now estop it from seeking affirmative relief as set up in its cross bill."

Seventy-seventh Exception.

Complainant excepts to the following finding and conclusion of law on page 126 of the printed report, to-wit:

"I construe this clause of the contract, providing for a purchase of the works, conditionally to have conferred a mere privilege upon the City, which it has not seen proper to exercise."

370 *Seventy-eighth Exception.*

Complainant excepts to the following finding and conclusion of law on page 125 of the report, to-wit:

"It may be stated, in general terms, that the continued default and inability of the Water Company relieves the City from its reciprocal obligations."

Seventy-ninth Exception.

Complainant excepts to the following finding and conclusion of law on page 131 of the printed report, to-wit:

"That the holders of the bonds of the Columbus Water Works Company have no greater legal right than the Company to a continuance of the present contract, and the Company having failed to perform its conditions, and the City being entitled to a cancellation thereof as against the Company, it has a similar right against the bondholders, who have no legal right to a continuance of the contract for their benefit."

Eightieth Exception.

Complainant excepts to the following finding and conclusion of law on page 131 of the printed report, to-wit:

"That the City of Columbus is entitled to have said contract rescinded, and declared set aside and annulled, and that it should be permitted to carry out the purposes of the ordinance of September 14, 1902, for the construction and operation of a system of water works."

371 *Eighty-first Exception.*

Complainant excepts to the following finding and conclusion of law of page 131 of the printed report, to-wit:

"That the Water Company is not entitled to the enforcement of the specific performance of its contract, nor of the validation thereof, nor to an injunction against the City's carrying out the purposes of its ordinance."

Eighty-second Exception.

Complainant excepts to the following finding and conclusion of law on page 134 of the printed report, to-wit:

"5. That the Act of 1902 is not a revocation of the franchise as defined in this contract."

Eighty-third Exception.

Complainant excepts to the following finding and conclusion of law on page 134 of the printed report, to-wit:

"That the City, in the exercise of its police power, could enact the ordinance now sought to be set aside, but with limitation as to the right of the Water Company and its creditors as may be determined by the Court."

Eighty-fourth Exception.

Complainant excepts to the following finding and conclusion of law on page 134 of the printed report, to-wit:

"7. That the acceptance of the Works was conditional, and the

Company not having fulfilled its assurances of complying
372 with the contract, and that without fault on the part of the City, the latter is not estopped from constructing a system of its own."

Eighty-fifth Exception.

Complainant excepts to the following finding and conclusion of law on page 134 of the printed report, to-wit:

"8. That City is released of its reciprocal obligations by reason of the continued default of the Company."

Eighty-sixth Exception.

Complainant excepts to the following conclusion and finding of law on pages 134 and 135 of the printed report, to-wit:

"9. That City could not in its execution of the contract in 1881, bind future administrations to purchase. The clause is to be construed as conferring a privilege of purchase and nothing more."

Eighty-seventh Exception.

Complainant excepts to the following conclusion and finding of law on page 135 of the printed report, to-wit:

"10. That the valuation of the system should be fixed at cost of reproduction and ten per cent. added for present connections with and supply of buildings."

373 *Eighty-eighth Exception.*

Complainant excepts to the following conclusion and finding of law on page 135 of the printed report, to-wit:

"That the contract with the City should be rescinded and injunction denied, and that the bondholders are not entitled to continue operating the works under the contract."

Eighty-ninth Exception.

Complainant excepts to the following conclusion and finding of law on page 135 of the printed report, to-wit:

"12. I have endeavored to distinguish from the present case the two cases of Walla Walla *vs.* Walla Walla Water Company, and Trust Company *vs.* City of Dawson, relied upon by complainant as controlling the issues of law in this case."

Ninetieth Exception.

Complainant excepts to the following conclusion and finding of law on page 139 of the printed report, to-wit:

"5. That the affirmative relief as prayed for in the cross bill of the City be granted, and that the City be allowed, after the deposit

of the aforesaid amount, to proceed to carry out the purposes of the ordinance providing for its water works system."

JOSEPH PACKARD,
HALL & WIMBERLY,
LOUIS F. GARRARD,
Solicitors for Mercantile Trust & Deposit Co. of Baltimore, Trustee.

J. PACKARD,
HALL & WIMBERLY,
L. F. GARRARD,
Of Counsel.

374 In Equity. In the Circuit Court of the United States for the Northern District of Georgia, Western Division.

MERCANTILE TRUST & DEPOSIT CO. OF BALTIMORE
v.
CITY OF COLUMBUS ET AL.

Bill.

CITY OF COLUMBUS
v.
MERCANTILE TRUST & DEPOSIT CO. OF BALTIMORE ET AL.

Cross Bill.

Exceptions in Behalf of the City of Columbus to the Report of the Master.

Now comes the City of Columbus, defendant named in the above entitled original bill and cross complainant in the above entitled cross bill, herein called the defendant, and presents these its exceptions to the report of the master filed herein on November 19th, 1904, as follows, to wit:

I.

Defendant excepts to the statement contained in the eleventh finding of fact on page 59 of the report as follows:

375 "The pressure required by the original contract (Sect. xxvii) was 32 pounds to the square inch." and says that the master should have found that the contract required a pressure ample for fire protection not less than the effective pressure due to the elevation specified therein; and that the provision that the pressure should not be less than 32 pounds during the hours named was intended merely as a test in order to determine whether the mains were of sufficient size to furnish the natural pressure due to the elevation.

II.

Defendant excepts to the finding on page 72 of the report "that prior to July, 1902, the water furnished by the company was, with

few exceptions, within the requirements of the contract," and says that the master should have found that the water was frequently so impure and unwholesome as to violate the requirements of the contract in that regard, and especially was the water so impure in the summer and autumn of 1890, 1894, 1895, 1898 and 1899.

Defendant says that the finding of the master herein quoted is not supported by the evidence and is inconsistent with the findings of the master, that when the water is low it is not wholesome (page 72), and that such periods of low water occurred in 1890 and notably in 1895, 1898 and 1899, and that in 1902, 1903 and 1904 there was a total failure (page 57).

III.

Defendant excepts to the 18th finding of fact set out on pages
87 to 89 of the report, wherein it is found that the present
376 value of the distribution system which it is declared could be made available by the city in connection with its proposed system is $176,562.62, with the river as a source of supply, on the following grounds, to-wit:

1. Because whether any portion of the present water system could be made available to the city in the construction of its proposed system, and the value of such portion, are issues not raised by the pleadings and are irrelevant to the correct determination of the cause.

2. Because evidence was not adduced by either party with respect to such questions, the same not being in issue, nor were these questions or either of them discussed by counsel in the argument.

3. Because there is no sufficient evidence in the record to sustain the said finding of the master.

4. Because the present value of a portion of the water system is not to be ascertained by finding the cost of reproduction and adding thereto ten per centum thereof as the value of the good will, without any deduction for depreciation in the value of the material. The defendant says that the true value to the City, should it desire to make the purchase, would be the cost to it to supply such distribution system as would be adequate to its needs and purposes, and that nothing should be added for good will nor should the value be based upon a particular source of supply.

IV.

377 Defendant excepts to the 2nd conclusion of law set out on page 99 of the report "that the contract in question did not create a debt in violation of the Constitution of Georgia," and says that the conclusion should be that the contract in question did create a debt in violation of the Constitution and Laws of the State of Georgia.

V.

Defendant excepts to the 4th conclusion of law set out on page 110 of the report, as follows:

"I therefore conclude that the grant of the franchise in this con-

tract is to be construed to mean that the City would not enter into competition with the Water Company as long as the contract for supplying water to the City could be complied with on the part of the Company, and that the grant was permissible as an incident to the performance of the principal undertaking,"

and also excepts to the construction given by the master to the legal principles upon which he bases such conclusion on the following grounds, to-wit:

1. Because the conclusion is inconsistent with the preceding conclusion of the master (page 104) that the City had no power to grant to the Water Company an exclusive franchise for the construction and operation of the water system, and any attempt on the part of the City to make such grant was *ultra vires*.

2. Because the master erred in finding (p. 105) that, notwithstanding the City could not grant an exclusive franchise, it could contract for a supply of water and engage during the period of the contract not to enter into competition with the grantee.

378 3. Because the master erred in finding (pp. 109-110) that the language of the contract clearly expressed the agreement that the City would not during the contractual period enter into competition with the Water Works Company, it appearing from the report of the master that the language of the contract was that the mayor and council should grant "a franchise for the exclusive privilege of maintaining and operating the works for a period of thirty years, or until such time as they may be purchased by the City." The defendant says that this language is incapable of being construed as constituting an express agreement that the City would not compete with the Water Company, that any such construction would arise by implication which the master has properly found is forbidden in a case of this kind, and that the only express agreement was that a franchise for the exclusive privilege should be given, and the master has properly found that no exclusive franchise could be granted.

4. Because the master erred in construing the reservation in the contract by the City of the right to purchase the works at intervals of fifteen years was limited to the contractual period of 30 years. Defendant says that this provision is to be construed according to its terms to mean until such time as the works should be purchased by the City, which was unlimited in time and therefore void as being in perpetuity.

VI.

379 Defendant excepts to the 5th conclusion of law that the Act of the General Assembly of Georgia, of 1902 conferring upon the City the right to construct its own system of waterworks can not be construed as a revocation of the grant made by the City to the Water Company; and especially excepts to the conclusion expressed in the following language of the master (p. 114):

"But on the contrary such construction would be in violation of the contract rights of the Water Company were the City, nothing

else justifying it, to endeavor to abrogate its contract obligation under authority of this Act. It is evident that such a course would be in a large measure, if not entirely, destroy valuable tangible property already rightfully acquired by the Water Companay."

Defendant says that the master should have found that the Act of December 3rd, 1902, was in the exercise of the reserved powers of the State and did revoke any exclusive grant or right that was attempted to be conferred by the City on said Company in said contract and should also have found that such a revocation would in no way violate any legal right of the Water Company.

VII.

Defendant excepts to so much of the 6th conclusion of law as denies to the City the right to determine what is the proper exercise of its police power, and especially to the finding that the Court will when the question is properly presented constitute itself the judge of the rightful use of this power. Defendant says that the conclusion should be that the authority vested with an exercise of the police power is the sole judge of the propriety of such exercise, and that its action in that regard is not the subject of judicial
380 review unless the discretion has been so plainly and palpably abused as to offend constitutional principles against the taking of private property for public use without just compensation.

VIII.

Defendant upon the grounds stated in Exception III above excepts to the 10th conclusion of law and fact that the value of that part of the system of the Water Company which could be made available in the construction of a new system is $176,562.62, and also to the method adopted by the master in arriving at this conclusion, and says that the whole of the 10th conclusion should be stricken from the report.

IX.

Defendant excepts to the 4th and 10th paragraphs of the summary of conclusions of law of the master on pages 134 and 135 upon the grounds herein before stated.

X.

Defendant excepts to the general recommendation of the master set out on pages 135 to 138 of the report, and says that the same should be stricken from the report upon the following grounds, to wit:

1. Because the question whether the City should be required to purchase any part of the present system at any price is not an issue in the case, is not raised by the pleadings, was not discussed
381 by counsel, and is irrelevant to a proper determination of the cause.

2. Because the Court is without authority or jurisdiction to make the decree in this cause conditional upon purchase of any part of the present system by the City, for that under the law and the evidence and under the findings of the master, the City is entitled as of right to an unconditional decree abrogating the contract with the Water Company and permitting it to proceed to construct its own system of waterworks; and it is only in cases where the relief prayed is discretionary with the court that terms can be imposed as a condition to granting the relief sought.

3. Because the City being entitled as of right to an unconditional decree in its favor, the imposition of the condition recommended by the master would violate the liberty of private contract and would in effect constitute the making by the court of an agreement of bargain and sale between the parties. This defendant is advised and respectfully submits that the power of a court is limited in the matter of contracts to their preservation and enforcement, and that it can not make agreements for parties or force them into contracts against their will.

4. Because the master having properly found that the bond-holders have no greater legal right than the Water Company to a continuance of the present contract, and having found that
382 the bonds were purchased with full notice both in law and in fact there can be no equity in favor of the bond-holders as against this defendant which would entitle the bond-holders to any relief which could not be accorded to the Water Company.

XI.

Defendant excepts to the first recommendation of the master (p. 138) to the court that a special reference be had for the purpose of ascertaining the value of that portion of the water system located in the State of Georgia, so far as the same can be utilized by the City to supply an adequate distribution system in the construction and operation of a waterworks system.

Defendant also excepts to the 2nd recommendation that upon the coming in of such report the City be required in terms of a conditional decree to pay into Court the sum so ascertained within a day specified.

Defendant also excepts to the 3rd, 4th and 5th recommendations in so far as they are conditional upon the requirements of the 1st and 2nd recommendations herein, and says that the first and second recommendations herein excepted to should be stricken from the report, and that the 3rd, 4th and 5th recommendations should be changed and modified accordingly.

Defendant also excepts — the 7th recommendation that the cost of the litigation be taxed equally between the parties, and says that the City being entitled as of right to a decree in its favor, it is the prevailing party and should be allowed its costs as against the other party.

383 Defendant also excepts to the 8th recommendation that in the event the City should fail to pay in the amount found

to be the value of the distribution system that could be made available, that injunction issue against the city and the bond-holders be permitted to carry out the contract as prayed in the amended bill, and says that such recommendation should be stricken from the report for the reasons and upon the grounds stated in paragraph X of these exceptions.

Wherefore, this defendant, the City of Columbus, prays that these its exceptions be heard and allowed by the Court, that the report of the master be accordingly modified, and that the City may have an unconditional decree in accordance with the prayers of its cross bill, and may also have decree denying the injunction and all other relief prayed by the complainant in the original bill.

T. T. MILLER,
J. H. MARTIN,
ELLIS, WIMBISH & ELLIS,
Solicitors and of Counsel for the City of Columbus.

384 *Offer by Plaintiff to Allow City of Columbus to Purchase Works, under Appraisement in Manner Provided by Contract.*

In the Circuit Court of the United States for the Northern District of Georgia, Western Division.

In Equity. No. 59.

MERCANTILE TRUST & DEPOSIT COMPANY OF BALTIMORE
v.
CITY OF COLUMBUS ET AL.

To the City of Columbus:

The Mercantile Trust & Deposit Company, the above named plaintiff, as trustee for the bondholders of the Columbus Water Works Company, with the consent and by the authority of the bondholders, and with the consent of and by the authority of the Columbus Water Works Company, hereby makes and renews to the City of Columbus the following offer:

The City of Columbus may purchase and is hereby given the right of purchasing, now or hereafter, the waterworks plant and property of every description of the Columbus Water Works Company, or covered by the mortgage or deed of trust made by said company to the Mercantile Trust & Deposit Company of Baltimore, and of which a copy is annexed to the above stated bill of complaint as an exhibit, including lands, buildings, reservoirs, supply mains, distributing mains, standpipes, pumps, engines, filter plant, valves, hydrants, water rights, easements, franchises and other rights and proper- of every description at a price or valuation to be fixed and ascertained as follows:

The valuation of said waterworks property to be ascertained by three (3) disinterested persons, non-residents of Columbus or the

County of Muscogee, and one of whom shall be a well known hydraulic engineer—one of said parties to be selected by the
385 City of Columbus, one by the Columbus Water Works Company or the Mercantile Trust & Deposit Company of Baltimore with the assent of the Columbus Water Works Company, and these two to select the third. When these three persons shall declare the value of the water works, the City shall pay the sum named with ten per cent. (10%) added to the amount for which the works have been valued, this being the method of valuation provided in the waterworks contract. The purchase shall be free of all liens, charges, debts, and obligations of every character or description, and the Mercantile Trust & Deposit Company of Baltimore obligates itself to convey or cause to be conveyed to the City of Columbus upon the payment of said purchase price a clear, unencumbered, good and sufficient title to said property.

This offer shall stand of force until rejected by the City of Columbus, or until the expiration of the charter of the Columbus Water Works Company, unless by reason of change of situation the offer shall be hereafter withdrawn, and in such event the offer stands good until actual notice in writing of such withdrawal is given to and received by the City of Columbus. The Mercantile Trust & Deposit Company of Baltimore heretofore made a similar offer prior to the bringing of the present suit, and regards said offer as one which has been continuously open until the present time, but the present offer is now made in order that there may be no doubt as to such fact.

THE MERCANTILE TRUST AND DEPOSIT COMPANY OF BALTIMORE,
By JOSEPH PACKARD AND
OLIN J. WIMBERLY,
Its Attorneys and Solicitors.

Copy served on W. A. Wimbish, Esq., of Att'ys for City of Columbus, M'ch 13, 1907.

W. A. WIMBISH.

Filed in clerk's office June 17, 1907.

O. C. FULLER, *Clerk.*

386 *Opinion of Court.*

In the Circuit Court of the United States for the Northern District of Georgia, Western Division.

No. 59.

MERCANTILE TRUST & DEPOSIT COMPANY OF BALTIMORE, Trustee
v.
THE CITY OF COLUMBUS ET AL.

Bill in Equity.

THE CITY OF COLUMBUS
v.
MERCANTILE TRUST & DEPOSIT COMPANY OF BALTIMORE, Trustee, ET AL.

Cross Bill.

This is a bill filed by the Mercantile Trust & Deposit Company of Baltimore, Trustee, for certain bondholders of the Columbus Water Works Company, against the City of Columbus, seeking to enjoin the City from selling bonds to build water works of its own. There is a cross-bill in which the City of Columbus seeks to have the contract between it and the Columbus Water Works Company annulled, on the ground of failure on the part of the Water Works Company to carry out its contract.

The case is now before the court on exceptions to the report of the master. There was a hearing on the case on an application for injunction *pendente lite*, the injunction granted, and the case referred to Henry R. Goetchius, Esq., Standing Master. 130 Fed. 180.

The master made a report, and pending the consideration of the same the Supreme Court decided the case of City of Dawson *v.* Columbia Avenue Savings Fund &c. Co. 197 U. S. 178. When that decision was announced, believing that case to be in all respects similar to the Columbus case, on motion of counsel for the City of Columbus, this case was dismissed for want of jurisdiction. The case was taken by the complainant to the Supreme Court of the United States on the question of jurisdiction, and the action of this court was reversed. Mercantile Trust & Deposit Co. of Balti-
387 more *v.* City of Columbus, 203 U. S. 311. The mandate of the Supreme Court having been filed in this court, the case was again argued on the exceptions to the master's report, it has been submitted and has been for some time held under advisement by the court.

The master's report is lengthy, going fully and exhaustively and ably into the facts at issue, and into the various legal aspects in which the case is presented. The facts necessary to an understanding of the case are briefly, but perhaps sufficiently, stated in the report

of the case on application for a preliminary injunction, in 130 Fed. 180.

A summary of the conclusions of fact by the Master in the report now before the court, as stated by him, is as follows:

"1. I have found that acceptance by the City was based on statement of the Water Company that the system had been completed in compliance with the contract and upon assurances by the company that the water would be wholesome, abundant and lasting.

2. The contract outlined.

3. Selection of source of supply and completion of the works November 6th, 1882.

4. I have found that the system as accepted by the City in 1882 had not met the general requirements of the contract, and that on complaints to the company the system had been improved to such an extent that in 1889 the service was at that time accepted as satisfactory to the City.

5. That from 1889 to May, 1900, there was dissatisfaction and complaints on the part of the City because of insufficiency of the water supply, and especially with the unsupplied needs of the City for water in its newly acquired territory; that the company had notice of this and recognized the necessity of increased water supply; that during this period the City through its Council twice made an effort to repudiate the contract, but were not sustained by the requisite popular vote on submission of the question to the people; that the company in good faith endeavored to adjust the differences by offer to arbitrate and the City declined the offer; and that finally the City accepted the existing conditions and concluded a supplemental agreement by which the company was given an opportunity to test its ability to carry out the requirements of the contract; that the company failed in this, and that in 1902 both the Council and the people determined to no longer depend upon the Water Company.

6. That the Water Company has at no time complied with Section III, requiring a reservoir of 125 million gallons available supply, and from 1884 it has failed to comply with the requirements of Section XII as to the construction and maintenance of the reservoirs.

7. That Paragraph XI as to filtration has not been complied with on the part of the Company.

8. That the company has failed to comply with Section V of the contract as to distribution in not connecting together the ends of its system and placing mains sufficiently large to at all times give full supply of water.

388 9. With reference to the supply of water, I have found that the company has failed to comply with Sections I and X in that sufficient supply of wholesome, constant and ample water has not, and cannot be furnished from the source of supply as selected, nor is the same sufficient to meet the wants of the City and private consumers for present and future requirements.

10. I have found that the company has not complied with Section IV as to supply main.

11. That as to pressure from 1893 to 1902, the pressure was variable and uncertain; that the gravity plan could not sustain it to the

requirements of the contract, and that the standpipe and pumping devices adopted to assist it, while practically beneficial, were not at all times satisfactory; that the company has not met the requirements of Section XXVII in maintaining pressure at 32 pounds, nor supplemental contract requirement of 40 pounds, and that in fires of any magnitude the pressure and water supply is insufficient, and that the supply is not ample for fire protection as required by Section IX, and that the Receiver by the improvement of the pumping station has greatly bettered conditions.

12. With reference to the wholesomeness of the water as required by Section X, I have found that the reservoir water when available is, under normal conditions, a wholesome water, but when the water is low it is not wholesome; that prior to July, 1902, the water furnished by the company was, with few exceptions, within the requirements of the contract, and in these exceptions the City has not availed itself of the provisions of Section XIII of the contract to correct impurities; that since July 1902, the Company has not furnished a constant supply of wholesome water, nor has the Receiver been able to do so; that the Chattahoochee river cannot be relied on as a constant source of supply for wholesome water, but only so when on a normal flow of the river, water is taken from points above all possibility of contamination and properly filtered.

13. I have found that the purchasers of the Water Company in 1890 acquired the stock of the company without consideration; that the property was acquired by the issue of half million dollars of bonds to the purchasers. Three hundred and twenty five thousand ($325,000) dollars of which was the agreed valuation of the property, and was used by themselves in its purchase; that the price was largely in excess of its actual value and that the syndicate who originally purchased these $325,000 of bonds knew or had full opportunity of knowing this fact; that of the cash proceeds of the sale of these $325,000, being the full amount less ten per cent. discount and added interest, the sum of $150,000 was applied to discharge an outstanding bond issue, and the purchasing company and its individual shareholders received the benefit of the remainder; that the subsequent purchasers, and who are still the present holders of these $325,000 bonds, bought the same from and upon representation of the bond syndicate.

14. That there are outstanding 392 bonds, of which 386 are on deposit with the bondholders' committee; that the 67 extension bonds should be placed on the same basis as the 325 bonds originally issued, and that at the time of the filing of the bill the company should be chargeable with interest on 392 bonds.

15. That the company has not been able, for want of available funds, to maintain and improve its system as the growth of the city demanded, and that extensions since 1891 have, from time to time, been, with the exception of a small amount, paid for by a necessary increase of a bonded indebtedness originally out of proportion to the earning capacity of the system, and constantly growing further beyond the ability of the system to maintain; that the system has not

been reinforced and strengthened as its needs require, and that the owners of the bonds of the company recognize this fact.

16. That the actual amount expended by the receiver to January 1904, on betterments is $42,220.85.

17. That the probable cost of proposed improvements, needed to make the system adequate for the present needs of the city, will be $85,000, exclusive of expenditures made by the receiver, and that such improvements and changes contemplate the river as a permanent source of supply.

389 18. That the present estimated value of the available portion of the system with the river as a source of supply is $176,562.62.

19. (This clause has reference to rentals and is not material here.)"

The Master's summary of his conclusions of law is stated as follows:

"1. I have concluded that the city had the power to enter into the contract, provided no State or Federal law was violated.

2. That the contract did not create a debt in violation of the Constitution of Georgia.

3. (This finding is immaterial here.)

4. That the grant of the franchise is to be construed as meaning that the City would not enter into competition with the Water Company as long as the contract for supplying water to the city could be complied with on the part of the company, and that the grant was permissible as an incident to the performance of the principal undertaking.

5. That the Act of 1902 is not a revocation of the franchise as defined in this contract.

6. That the City in the exercise of its police power could enact the ordinance now sought to be set aside, but with limitations as to the rights of the Water Company and its creditors as may be determined by the court.

7. That the acceptance of the works was conditional, and the company not having fulfilled its assurances of complying with the contract, and that without fault on the part of the City, the latter is not estopped from constructing a system of its own.

8. That the City is released of its reciprocal obligations by reason of the continued default of the company.

9. That the City could not in its execution of the contract in 1881 bind future administrations to purchase. The clause is to be construed as conferring a privilege of purchase and nothing more.

10. That the valuation of the system should be fixed at cost of reproduction and ten per cent. added for present connections with and supply of buildings.

11. That the contract with the City should be rescinded and injunction denied, and that the bondholders are not entitled to continue operating the works under the contract.

12. (The 12th finding is also immaterial here.)

As to the peculiar rights of the bondholders in this case the Master, after some discussion of the matter, concludes as follows:

"I conclude:

1. That the holders of the bonds of the Columbus Water Works Company have no greater legal right than the company to a continuance of the present contract, and the company having failed to perform its conditions, and the City being entitled to a cancellation thereof, as against the company, it has a similar right against the bondholders who have no legal right to a continuance of the contract for their benefit.

2. That the City of Columbus is entitled to have said contract rescinded and declared set aside and annulled, and that it should be permitted to carry out the purpose of the ordinance of September 14, 1902, for the construction and operation of a system of water works.

390 3. That the Water Company is not entitled to the enforcement of the specific performance of its contract, nor of the validation thereof, nor to an injunction against the city's carrying out of the purposes of its ordinance."

The Master then makes the following recommendations based on his findings of fact and of law:

"Reviewing the several findings of fact, and conclusions of law and fact as applicable to this case on its merits, I have to submit, in conclusion, the following:

The case is before the court under proceedings brought about by the Trustee moving against the Columbus Water Works Company in the interest of the holders of bonds of the Company. Both the plaintiff and defendant in the foreclosure proceedings are parties to the present bill. The City, as defendant herein, is applying through a cross bill for affirmative relief. The court is in control of and operating the property. Connected with the legal questions involved is the grave question of supplying the population of a large and rapidly growing city with wholesome and abundant water for domestic and sanitary uses and for protection of property. 'The consideration of public interest will largely influence a court of equity when property upon which an entire city is dependent for its water comes into the power and under control of the court.' Joy *et al. v.* City of St. Louis, 138 U. S. 1, 34 L. Ed. 843. On the other hand the bondholders, the real parties at interest as to the disposition of the property in litigation, have supplied all the funds both for the original purchase and enlargement of the works, to the extent they have been enlarged. It is true they assume the risk of the investment, and their legal rights are no higher than those of the Water Company, but there may be an equity in their favor. There are portions of the system, lying within the City of Columbus, which could possibly be made available for the future uses of the City from whatever source her water supply is drawn. While the City is entitled to a recission of the contract and may proceed to construct her own water system, such a system operated independent of that of the Water Company would without doubt greatly

destroy, if not render entirely valueless, the property to which these bondholders now look for the security of their bonds. Would it not be in accordance with equity and good conscience to require the City, in view of all the facts developed in this case, to utilize this available portion of the system at its reasonable and fair value and the proceeds be appropriated for the benefit of the holders of the bonds? The court having jurisdiction, and having power to do, under the present bill, whatever may be necessary or proper to fully protect the rights of all and do equity between the parties, can mould a decree which will work no injustice. Whatever be the value of the present water works property any portion of it which can be of use to the City in the construction and operation of future water works should be made available for that purpose, and the net proceeds thereof should in equity be applied for relief to that extent of the holders of bonds of the Water Company. It would be manifestly unjust and inequitable to allow the City to proceed unconditionally with its plan to provide the inhabitants with water and not protect the interests of these bondholders to the extent, at least, of the value of such portions of the system as may be available for the City's use. To quote the language of one of the able counsel for the complainant: 'They (the bondholders) are entitled to be protected to the extent of the value that is there.' While he referred to the value of the entire system, the statement is equally applicable to the portion which may be available for the City's uses. The bondholders have proposed to sell the present system to the City at a fair valuation. The City contracted for
391 the privilege of purchasing the system, and while I have found this not to be a binding legal obligation of purchase it may in equity be enforced to the extent of requiring a purchase of such parts of the system as the City may now use. I have found that the portions lying in the State of Alabama are of no practical value. The valuation I have found is applicable only in case the river is to be used as a source of supply, and I have found that this was not in the minds of the parties when the contract was entered into.

A decree in this cause refusing injunction and declaring the contract annulled and cancelled should not be unconditional. The available property need not be necessarily lost to the bondholders, if they be willing to save it upon the terms decreed by the court. They could be permitted to accept from the City a fair valuation thereof and the City could be required to pay the same before proceeding to carry out the purposes of its ordinance. If, on the opportunity being afforded, the complainant, trustee for the bondholders, declines to accept the valuation fixed by the court and convey to the City the available part of the system, then the City should be permitted unconditionally to proceed with its undertaking.

I therefore recommend:

1. That in order to ascertain what may be the value of the portion of the system located in the State of Georgia, so far as the same can be utilized by the City to supply such a distribution system

as would be adequate for the needs and purposes of the City in the construction and operation of a water works system, a special reference be had to take testimony of experts upon this question and that a report be had thereon.

2. That on such report being made the City be required, in terms of a conditional decree, to pay into court for the use of the trustee, complainant in this cause (subject to prior payments as may be decreed), the sum ascertained by said report, said payment to be made within a day specified after the filing of written consent on the part of the trustee for the bondholders to accept said amount in satisfaction of all interest and claim of right which said bondholders allege as existing under the outstanding bonds of the company or otherwise.

3. That thereupon the lien attaching by virtue of the trust deed, or otherwise, held by the complainant to secure the bonds of the water company, so far as the same applies to the property of the company within the corporate limits of the City of Columbus, Muscogee County, State of Georgia, and found under said reference to be of use to the city, be released and cancelled, and that the Columbus Water Works Company, and the Mercantile Trust & Deposit Company of Baltimore, execute and deliver to the City of Columbus a conveyance of all said property, free from all liens and encumbrances under said trust deed and mortgage, and that the trustee be required to so enter upon said deed, and upon the several bonds on deposit with it and those held for the committee of bondholders in this cause, and that the holders of such bonds as have not been so deposited or held shall be estopped from setting up any claim or lien upon the property so conveyed, and further that the eight bonds held by the Receiver be surrendered and cancelled, and Receiver's certificates be substituted therefor as collateral for the outstanding indebtedness secured by said bonds.

4. That out of the funds decreed to be paid into court there shall first be paid any sums necessary for redemption of all outstanding certificates of the Receiver, and such other sums as may be proper to be paid after an accounting has been had of the indebtedness of the Receiver, and that the property above named be declared free of all lien of Receiver's certificates and all other liens.

392 5. That the affirmative relief as prayed in the cross bill of the City be granted, and that the City be allowed, after the deposit of the aforesaid amount, to proceed to carry out the purposes of the ordinance providing for its water works system.

6. (The 6th recommendation is immaterial here.)

7. That the cost of the litigation be taxed equally between the parties.

8. That in the event the City fail to pay in the amount on the day specified as provided in the second paragraph herein, when written acceptance is filed by the Trustee as required, then injunction issue against the City, and the bondholders be permitted to carry out the contract as prayed in their amendment to the bill, and all costs be taxed against the City; but in the event the acceptance of

the Trustee is not filed, as required, then the bill of complaint be dismissed and the City permitted to proceed to carry out the purposes of its ordinance of September 1902, and all costs to be taxed against the complainant."

The principal legal questions controlling in this case are, (1) Whether the City under its charter had the authority to contract for a supply of water for the city and its inhabitants; (2) Whether the contract in this case created a debt in violation of the Constitution of the State of Georgia; and (3) Whether the exclusive character of the contract in this case can be upheld.

It is well settled in Georgia, as held by the Master, and as determined by Circuit Judge Pardee in the case of Columbia Avenue &c. Trust Co. *v.* The City of Dawson, *supra*, that cities have the power under the "general welfare" clause of their charters, to enter into contracts for a water supply for their inhabitants for domestic use and for fire protection. Mayor and Council of Rome *v.* Cabot, 28 Ga. 50; Wells *v.* Mayor and Council of Atlanta, 43 Ga. 67; Grace *v.* Hawkinsville 101 Ga. 553.

That the action of the city council of Columbus in entering into this contract did not create a debt in violation of the Constitution of the State is also held by the Master in this case, following the decision in the Dawson case. After quoting from the report of the special master, approved by Judge Pardee, in the Dawson case, it was said in this case on the former hearing, (130 Fed. 184):

"From these citations it will be seen that the decisions of the Supreme Court of the state were quite as favorable to the validity of the contract in this case as they were at the time of the con-
393 tract in the Dawson case. If in that respect there is any distinction in the two cases, it is favorable to the complainant here."

The views of the court in the Dawson case, and in this case when the former decision was made, are well expressed by the Master in the Dawson case, in this language, (130 Fed. 171):

"It cannot therefore fairly be said that there was such a settled course of judicial decisions in Georgia on this question at the time of the making of the contract, as to constrain the courts of the United States to follow later decisions of the state court, especially in a case where the rights of innocent third parties are concerned."

The decisions of the supreme court of the State of recent years have been to the contrary, but this could not affect the contract if, at the time it was made, the decisions of the supreme court were as stated. I see no reason for departing from what was held in the Dawson case, and what was before held in this case as to this question.

The next, and perhaps most important legal question involved in this case is that of the exclusive character of the contract. When this case was before the court on the application for injunction *pendente lite*, the Walla Walla case, (172 U. S. 1) was the most important and controlling case on the subject of the exclusive character of such contracts as this. Since that time a number of decisions have been made. The three most recent cases are Knoxville Water Co. *v.* Knoxville, 200 U. S. 22, Vicksburg *v.* Vicksburg Waterworks Co. 202

U. S. 453, and the quite recent case of Water, Light and Gas Company of Hutchinson *v.* The City of Hutchinson, 207 U. S. 385. These three cases cite quite a number of preceding cases, none of which need be discussed here in the view that is taken of the question as determined by the facts of this case, and of the contract under consideration.

In the Knoxville case it is held by a majority of the Supreme Court, (four Justices dissenting) that an agreement on the part of a city with a water works company not to enter into a contract with any other parties for the establishment of water works during the period of the contract, did not prevent the city itself from erecting water works.

394 In the Vicksburg case it was held that the exclusive character of the contract entered into in that case prevented the city from entering into competition with the water works company by the erection of water works of its own.

In the Hutchinson case, the decision seems to have been based on local statutes and decisions of Kansas, and it was determined by the Supreme Court that under those statutes and decisions the City of Hutchinson was not authorized to enter into an exclusive contract.

The case here is more nearly like the Vicksburg case. Assuming, as I have, that the city had authority, under the general welfare clause in its charter, to enter into this contract, and that it did not, as the decisions stood at the time the contract was made, create a debt in violation of the Constitution of the State, there is nothing, so far as I have been able to see, and certainly nothing has been brought to the attention of the court, under the statutes and decisions of this State, which would prevent the City of Columbus from making an exclusive contract for a limited period, if that contract was a necessary and indispensable incident to the contract for a supply of water. That such a grant of an exclusive privilege was necessary and indispensable to the main undertaking of the city, seems to me to be beyond question. Considering the size of the city of Columbus at the time this contract was entered into, and the number of its inhabitants, it would have been an impossibility to have had any one enter into a contract of this sort, if the parties so contracting were to be met immediately, or soon thereafter, with competition from another water works company or from the city itself engaging in the business of supplying water to the city and its inhabitants. Such a contract would have been utterly valueless and no one would have undertaken the expenditure necessary for the establishment of such a system of water works as was contemplated by this contract, and was actually established, unless they had been guaranteed an

395 exclusive right for some reasonable period at least, for rendering the service and receiving the return expressed in the contract. Competition from other parties, or from the city, would of course have destroyed the entire value of the outlay. It is clear that responsible parties would not have entered into any such contract except for its exclusive character. This being true it comes within the decision in the Vicksburg case. (202 U. S. 453.) The language of the Court in that case, in the opinion by Mr. Justice

Day, is so pertinent here that I quote from it at some length, as follows:

"The contract in the respect under consideration is found in section 1 of the ordinance, and undertakes to give to Bullock & Company, their associates, successors and assigns, the exclusive right and privilege, for the period of thirty years, from the time the ordinance takes effect, of erecting, maintaining and operating a system of waterworks, with certain privileges named, for the furnishing of a supply of good water to the City of Vicksburg and its inhabitants, for public and private use.

Without resorting to implication or inserting anything by way of intendment into this contract, it undertakes to give by its terms to Bullock & Company, their associates, successors and assigns the exclusive right to erect, maintain and operate waterworks, for a definite term, to supply water for public and private use. These are the words of the contract and the question upon this branch of the case is, conceding the power of the city to exclude itself from competition with the grantee of these privileges during the period named, has it done so by the express terms used? It has contracted with the company in language which is unmistakable, that the rights and privileges named and granted shall be *exclusive*. Consistently with this grant, can the city submit the grantee to what may be the ruinous competition of a system of waterworks to be owned and managed by the city, to supply the needs, public and private, covered in the grant of privileges to the grantee? It needs no argument to demonstrate, as was pointed out in the Walla Walla case, that the competition of the city may be far more destructive than that of a private company. The city may conduct the business without regard to the profit to be gained, as it may resort to public taxation to make up for losses. A private company would be compelled to meet the grantee upon different terms and would not likely conduct the business unless it could be made profitable. We cannot conceive how the right can be exclusive, and the city have the right at the same time to erect and maintain a system of waterworks, which may and probably would practically destroy the value of rights and privileges conferred in its grant. If the right is to be exclusive, as the city has contracted that it shall be, it cannot at the same time be shared with another, particularly so when such division of occupation is against the will of the one entitled to exercise the rights alone. It is difficult to conceive of words more apt to express the purpose that the company shall have the undivided occupancy of the field so far as the other contracting party is concerned.

The term "exclusive" is so plain that little additional light can be gained by resort to the lexicons. If we turn to the Century Dictionary, we find it defined to mean 'Appertaining to the subject alone; not including, admitting or pertaining to any other or others;
396 undivided; sole; as, an exclusive right or privilege; exclusive jurisdiction.' We think, therefore, it requires no resort to implication or intendment in order to give a construction to this phase of the contract; but on the other hand, the city has

provided and the company has accepted a grant which says in plain and apt words that it shall have an exclusive right, a sole and undivided privilege. To hold otherwise in our view would do violence to the plain words of the contract, and permit one of the contracting parties to destroy and defeat the enjoyment of a right which has been granted in plain and unmistakable terms. On the authority of the Walla Walla case, the city had the power to exclude itself for the term of its contract, giving the words used only the weight to which they are entitled, without strained or unusual construction, and we think it was distinctly agreed that for the term named the right of furnishing water to the inhabitants of Vicksburg under the terms of the ordinance was vested solely in the grantee, so far at least as the city's right to compete is concerned. Any other construction seems to us to ignore the language employed and to permit one of the parties to the contract to destroy its benefit to the other. We think the court below did not err in reaching this conclusion."

The above language appears to be conclusive of the question before the court in this case. The contract in that case was exclusive and in this case it is exclusive. It was for thirty years in both cases. I do not see either, any material difference between the local law in Mississippi and the law in Georgia at the time the Columbus contract was entered into. My conclusion, therefore, is that the exclusive feature of this contract must be upheld.

It may be proper, however, in this connection to consider the effect of certain provisions of the Constitution of Georgia, which were relied upon by counsel for the City. Article 1, Section 3, Par. 2, of the Constitution of the State of Georgia of 1877, provides that:

"No bill of attainder, *ex post facto* law, retroactive law, or law impairing the obligation of contracts, or making irrevocable grants of special privileges or immunities, shall be passed."

The succeeding paragraph 3, provides:

"No grant of special privileges or immunities shall be revoked, except in such manner as to work no injustice to the corporators or creditors of the incorporation."

The provision of the Constitution of the State of Mississippi is as follows:

"Corporations shall be formed under general laws only. The legislature shall have power to alter, amend or repeal any charter of incorporation now existing and revocable, and any that may hereafter be created, whenever in its opinion, it may be for the public interest to do so; provided, however, that no injustice shall be done to the stockholders."

397 The Supreme Court, in the opinion in the Vicksburg case, (202 U. S. 464-465) after referring to the fact that the Constitution in which this provision occurred was adopted in 1890, and the contract in that case was created by an ordinance which was passed in 1886, refers to the case of Hamilton Gas Light & Coke Co. *v.* City of Hamilton, 146 U. S. 258, and proceeds in this language:

"Furthermore, the Mississippi Constitution contains this provision which is not in the Ohio Constitution considered in the Hamilton case, namely, 'Provided, (in exercising the right of amendment or repeal of a charter) no injustice shall be done to the stockholders.' If it be true that the complainant below had a binding contract excluding competition by the city in furnishing a water supply for the period of thirty years, we think it would be a palpable injustice to the stockholders to permit the competition of the city by new works of its own; which whether operated profitably for the municipality or not, might be destructive of all successful operation in furnishing water to consumers by the private company."

I think this citation of authority alone sufficient without referring to other cases in which similar clauses in State constitutions are discussed. The effect of the action of the City of Columbus on the creditors and bondholders of the water works company will be hereinafter referred to.

The Master discusses the question raised by counsel for the city as to the right of the City, in the exercise of its police power, to provide for another supply of water. He concludes that the city has such right, subject to certain rights of the Water Company and its creditors, which he discusses later.

Assuming, therefore, that this is a valid contract, binding upon the city, and that the city was precluded thereby from entering into competition with the Water Works Company by erecting a system of its own, we come now to the question of whether or not the Water Works Company on its part has complied with its contract. I do not agree with the Master entirely as to some of his findings in this respect. It seems to me, under the facts as shown by the evidence, that when the city council was informed that the water works system had been completed, and the council with the aid of experts, examined the system and expressed its satisfaction and approval, it could not afterwards set up defects in the original construc-
398 tion of the system; so that as to the sufficiency of the reservoir, mains, filters, &c., I should be disposed to disagree with the Master, but as to the Master's finding that there was a failure to furnish an abundant supply of pure and wholesome water, the facts in evidence before him justified his findings, particularly as to September, 1902. While there were some failures before that to give the city and the people all that they ought to have had in this respect, these failures were passed over by the city, and as a rule the trouble was remedied, and the satisfaction of the city council expressed in the changes and improvements made. The people of the city twice refused during the contract, in 1894 and in 1897, to vote by the necessary two-thirds majority in favor of the issuance of bonds by the city for the erection of a waterworks system of its own. Although there had been complaints from the time of the completion of the waterworks in 1882 until 1889, the Master found that in 1889 the system had been improved to such an extent that it was accepted as satisfactory to the city. For several years there were

negotiations between the city and the Water Works Company with reference to supplying water to additional territory which had been taken into the city, and these negotiations appear to have resulted in a practical agreement in 1900, although there were some few items of disagreement. The Master's finding as to the condition from 1889 to 1900, is expressed as follows:

"I find that from 1889 to May 1900, except at comparatively short intervals, there was dissatisfaction and complaints on the part of the city because of insufficiency of the water supply, and especially with the unsupplied needs of the city for water in its annexed territory; that the company had notice of this and recognized the necessity of increased supply. I further find that during this period the differences between the company and the city led to an effort by the council on two separate occasions to repudiate the contract, but that it was not sustained by the requisite popular vote, thereby indicating the desire of the people to give the company an opportunity to carry out the terms of the contract; that the company in apparent good faith endeavored to adjust the differences by offer to arbitrate and the council declined, and that finally the council accepted existing conditions and concluded a supplemental agreement by which the company was given an opportunity to test its ability to fully meet the requirements of the contract; and that in 1902 both the council and the people determined to no longer depend upon the Water Company."

399 The source of supply of water selected by White, and accepted as has been stated, by the City, was in Alabama, four miles west of Columbus. A reservoir was first constructed of stone, and afterwards, in 1885, a second or upper reservoir, immediately above the lower and first reservoir, was constructed by building a dam across the upper end of the first reservoir. The real difficulty, as gathered from the evidence, seems to have been the inadequacy of the supply, and also the failure on the part of the company to construct the upper reservoir as it should have been. The Master finds that when the stream supplying these reservoirs became abnormally low, and the upper and lower reservoirs not properly supplied, that the water became stagnant and impure, and greatly limited in quantity. He finds that this condition existed in 1894, 1895, 1898 and 1899, and notedly so in 1902. The serious condition which existed in 1902 led unquestionably to the action of the people of the city in voting almost unanimously in favor of the issuance of bonds, which is in controversy here. Of course one of the conditions, and perhaps the main condition, which caused the trouble in 1902, was an unusual d-ought. This condition really existed again in 1904 for a short time, and would have been serious perhaps but for the prompt action of the Receiver, under the authority of the court, in remedying the difficulty by arranging to obtain water from the Chattahoochee river at a point above contamination.

There may be some merit in the claim made by counsel for the complainant that the action of the city council, and of the people, interfered to some extent with the ability of the Water Works Company to carry out its contract. This, if true, was mainly so as to the

agitation in the city council and among the citizens on the subject of municipal ownership, thereby affecting the credit of the Water Works Company and its ability to make further improvements. But even making some allowance for this, in my judgment the facts in evidence were sufficient to justify the Master in finding that there was a failure on the part of the company to furnish an
400 abundant supply of pure and wholesome water as provided in the contract, and finding the company at fault in this respect.

It is a serious matter to undertake to supply the inhabitants of a city with an ample supply of good and wholesome water, and persons entering into a contract to do this necessarily must do so with an understanding of the important character of the undertaking. This is particularly true of a growing city. Taking this whole record together, and considering all the evidence, the Master, as has been stated, was justified in reaching the conclusion that there was a failure to comply with the contract in this respect.

The prayer of the cross-bill filed by the City is that it have a decree annulling the contract with the Water Works Company, and that the cross-defendants be perpetually enjoined from setting up any right or interest thereunder. This would be in effect decreeing a forfeiture of the Water Works Company's rights under its charter and under the ordinances of the City, and under its contract. This will not be done in a court of equity, and certainly not except upon the same conditions that the prayer of the complainants in the original bill for an injunction will be denied. It should not be done unconditionally in any event, and clearly not as against the bondholders. Substantially and practically the action of the court in either finally granting or denying the injunction will settle the rights of the parties in this case, so that a decree upon the cross-bill is really unnecessary, even if it is allowable.

I come now to the consideration of the recommendation of the Master as to the conditions upon which a final decree denying the injunction sought by the complainant, should be entered. As shown by the record in this case, on December 22nd, 1902, a bill was filed by the Mercantile Trust & Deposit Company of Baltimore, trustee for the bondholders, against the Company. William S. Greene was appointed receiver, and permission was granted the receiver to issue $50,000 of receiver's certificates, the trustee for the bondholders consenting thereto, for the purpose of making improvements to
401 the waterworks plant. The receiver assumed charge on January 15th, 1903. At the time the report of the Master was filed the receiver had expended $47,220.85 in improvement of the plant, the larger part of which was for a filter plant and pumping station. Since that time the receiver has expended a considerable additional amount in improvements. From the time he took charge the receiver has, with one exception, been furnishing the city with fairly good water and with a sufficient supply of the same. The exception was in the summer of 1904, during a protracted drought, when the streams in Alabama were almost dried up and the Chattahoochee river very low. The main difficulty was that the intake was at a point below where there was some contamination of the river. This

was promptly remedied, and since that time there has been no complaint, at least none has been brought to the attention of the court.

The bondholders acting through their committee, have done everything reasonably within their power to make the present waterworks system effective and satisfactory. I am not satisfied that under the facts of this case it is brought within the ruling of the supreme court in Farmers Loan & Trust Co. *v.* The City of Galesburg, 133 U. S. 156. In that case it was held that the rights of the bondholders were no higher than those of the company, the decision being based of course on the facts of that case. In this case the city has for five years accepted and received the benefit of the efforts of the bondholders to give the city a good supply of water. While of course the bondholders were interested in protecting their security, the result of the work and improvements, for which they furnished the funds, has been to give the city what is conceded I think by all parties to be at least a fairly good supply and quality of water. They must continue to do this until the end of this litigation, whenever that may be, for the idea could never be entertained of allowing the waterworks to be stopped and the city left practically without water, as it would be now unless this system was continued. The
402 maxim "He who seeks equity must do equity," is applicable here. I conclude that not only in justice and fairness, but testing the matter by sound principles of equity, the city, as against these bondholders, should be required to take so much of this waterworks plant as may be hereafter determined, at a fair valuation, as a condition of, and before entering a decree in its favor finally denying an injunction in the case against the issuance by the city of its waterworks bonds.

The Master finds that the present estimated value of the available portion of the system, with the river as a source of supply, is $176,562.62. This does not include the value of that portion of the company's property in Alabama, including its lands, reservoirs, pipes and right-of-way in Alabama. It seems to me that it would be impracticable to detach this portion of the system from the other, in the manner suggested by the Master. The Alabama property must be in any view of it, of considerable value, and for some time to come, allowing for any direction this case may take, it should and doubtless will be used as a partial source of supply. There is a provision in the contract that,

"At the end of fifteen years from the completion of the works the city shall have the right to purchase the same with all the rights, franchises and property at a price to be mutually agreed upon, or the valuation may be ascertained by three disinterested non-residents of Columbus or Muscogee county, one to be a hydraulic engineer—the city to appoint one arbitrator, White one, and these two to select a third. When the value of the works is thus ascertained and declared, the city shall pay the sum named with ten (10) per cent. added; and the city shall, in this purchase, assume all the obligations of White, the lawful acquittances of which shall be received by White as a part of the cash payment of the declared value of the water works. The obligations include such as are for operating,

maintaining and extending the same, and the duties incident thereto. In assuming money obligations for indebtedness, or choses in action, due from White to others, the same shall be in lieu of cash payments to equal amounts, and no obligation to assume money liabilities greater than the value to be paid by the city; but the city has the right to decline the purchase after the value is ascertained upon payment of expenses of arbitration. If the city does not buy on this valuation when ascertained the right and privileges of White shall continue in force until the final purchase of the works by the city. The right to purchase shall inure to the city every 15 years, but in every case White is to have 12 months previous notice of the city's intention to purchase."

403 In my opinion this provision of the contract adds to the duty of the city to take this waterworks plant at a fair valuation, as it was clearly in the minds of the parties, the city and White, the assignor of the Columbus Water Works Company, that if the city should desire to establish municipal ownership it might take this plant at a fair valuation. It adds something at least, to my mind, to the equities of the bondholders in the present situation.

I can understand and appreciate fully the desire of the authorities and of all the people of Columbus for an adequate supply of good water. Nothing is more necessary to the welfare and comfort of the people. They are entitled to this and should have it. But there is no reason whatever why the present water works plant, or certainly the greater part of it, cannot be utilized in connection with any new source of supply that may be resorted to by the city.

I agree substantially with the recommendation of the Master stated above as to the terms upon which a decree denying an injunction should be entered, except that I think it should be conditioned upon paying the fair value of such property of the company, that is the whole or a part as the court may decree, after ascertaining in proper manner the value now of the property in Georgia, and the value of the entire property with that in Alabama added. Considerable additions and a number of improvements have been made to the property in Columbus since the Master's report. The city should have the option, however, of having the value of the property submitted to arbitration, as provided in the contract, in case it should elect to do so. This arbitration should fix the value in the manner just mentioned, that is the value of the property in Georgia, and the value with the property in Alabama added, so that both valuations will be before the court.

Before a final decree is entered in this case a reasonable time should be given the city authorities to consider the matter
404 and determine what action they think it advisable to take. This litigation has already been greatly protracted, and probably sixty days' time for this purpose will not be unreasonable, and no final decree will be entered for that time.

This April 25th, 1908.

WM. T. NEWMAN,
U. S. Judge.

Filed in clerk's office April 25, 1908.
O. C. FULLER, *Clerk*,
By N. A. BROWN, *Deputy*.

405 *Petition of Respondent for Final Decree to be Entered.*

In the Circuit Court of the United States for the Northern District of Georgia, Western Division.

No. 59. In Equity.

MERCANTILE TRUST & DEPOSIT COMPANY OF BALTIMORE, Trustee,
v.
THE CITY OF COLUMBUS ET AL.

Bill.

THE CITY OF COLUMBUS
v.
MERCANTILE TRUST & DEPOSIT COMPANY OF BALTIMORE, Trustee, ET AL.

Cross Bill.

Now comes the City of Columbus defendant and cross-complainant in the above entitled causes and represents to the court as follows, towit:

First. That heretofore, to-wit, on the 25th day of April, 1908, this honorable court rendered a decision and handed down an opinion in the above entitled causes, in which opinion it was declared among other things that a decree denying the injunction as prayed for by the complainant should be entered upon the condition that the City should pay the fair value of such property of the Columbus Water Works Company as might be thereafter ascertained, and that the City should have the option of having the value of the property submitted to arbitration as provided in the contract in case it should elect so to do. In such opinion it was further declared that before a final decree is entered in this case a reasonable time shall be given the City authorities to consider the matter and determine what action they think it advisable to take, and for this purpose the court allowed sixty days.

406 Second. That the matter was brought to the attention of the City of Columbus, and at a meeting held on May 6th, 1908, the City acting through its board of Mayor and Aldermen adopted a resolution respectfully declining to accept a decree upon the conditions imposed, and directing counsel for the City to make application to the Court to enter such decree as will permit the City, pending an appeal to the Supreme Court, to proceed to construct a system of water works of its own, but not to operate such system in competition with the present water works system unless and until a

avorable decision should be obtained in the Supreme Court, or the ld contract with the Water Works Company should expire by its erms. A certified copy of this resolution is hereto attached and eave of reference thereto is hereby prayed.

Wherefore, the City of Columbus by its counsel submits this its pplication and prays the Court to enter such a decree as will permit he City to proceed with the construction of its own system of water vorks, but not to operate the same, or any part thereof until the ex- piration of the old contract, or until otherwise ordered by the court.

T. T. MILLER,
WIMBISH, WATKINS & ELLIS,
Solicitors and of Counsel for The City of Columbus.

COUNCIL CHAMBER.
COLUMBUS, GA., *May* 6, 1908.

Alderman Dismukes offered the following resolution, which was adopted:

"The attention of this body being called to an interlocutory order of the judge of the district court of the United States, in the case of the Mercantile Trust & Deposit Co., of Baltimore, *vs.* The City of Columbus *et al.*, pending in said court, in which order it is proposed
that before entering a decree denying the injunction as prayed
407 for, that the City of Columbus be required, at a fair valuation, to purchase either the whole or a part of the system of water-works owned and operated by the Columbus Water Works Company, as may be hereafter determined by the court; and said order providing further that in the event of the City of Columbus declining to accept such conditions imposed, that a decree be entered granting an injunction, as prayed for in the proceeding; and

Whereas, this body is in receipt of a communication from the board of water commissioners at a called meeting held on the 4th day of May, 1908, at which meeting the attorneys representing the City were present, and requested this body to take action, requesting the court to enter a decree at once but so modified pending an appeal to the Supreme Court of the United States as will permit the City to sell its bonds, and proceed to construct a system of waterworks of its own; but not to be operated until a favorable decision of said Supreme Court or the expiration of the contract with Thos. R. White, and assigned to the Columbus Water Works Co., which expires in September, 1911, so that said City may at the expiration of said contract be ready to operate its own system, in case it may choose to do so.

It is therefore resolved by the Mayor and Board of Aldermen of the City of Columbus as follows:

1. That this body is heartily in sympathy with the resolution adopted by the Board of Water Commissioners; and that the attorneys representing the City be, and they are hereby, requested to have the judge of said court enter a decree without delay of sixty days or any considerable time but so modified as to permit the City to sell its bonds and construct a system of waterworks of its own,

not to be operated pending an appeal to the Supreme Court of the United States or until the expiration of the contract now existing between said City and the Columbus Water Works Co., which expires in September, 1911.

408 2. Be it further resolved, that the attorneys representing said City be, and they are hereby, requested upon entering said decree that they enter an appeal therefrom to the United States Supreme Court, as it is the sense of this body that the City is entitled to an unconditional decree in its favor denying said injunction; and that said attorneys are hereby authorized to prosecute said appeal, as by statute in such cases made and provided."

COUNCIL CHAMBER,
COLUMBUS, GA., *May* 9, 1908.

I, M. M. Moore, Clerk of Council of the City of Columbus, Ga., hereby certify that the foregoing is a true extract from the minutes of the Board of Mayor and Aldermen of said City for the date named.

Witness my hand and seal of said City this 9th day of May, 1908.

[Seal Corporation of the City of Columbus, Georgia.]

M. M. MOORE,
Clerk Council.

Filed in clerk's office May 23rd, 1908.
O. C. FULLER, *Clerk,*
By J. D. STEWARD, *Dep. Cl'k.*

409 *Final Decree.*

In the Circuit Court of the United States for the Northern District of Georgia, Western Division.

No. 59.

MERCANTILE TRUST & DEPOSIT COMPANY OF BALTIMORE, Trustee,
v.
THE CITY OF COLUMBUS ET AL.

Bill in Equity.

THE CITY OF COLUMBUS
v.
MERCANTILE TRUST & DEPOSIT COMPANY OF BALTIMORE, Trustee, ET AL.

Cross Bill.

This cause came on to be heard at this time on exceptions to the report of the master, and upon final hearing of the cause for the determination of the questions of law and fact, and the rendition of a final decree, and was argued by counsel.

been reinforced and strengthened as its needs require, and that the owners of the bonds of the company recognize this fact.

16. That the actual amount expended by the receiver to January 1904, on betterments is $42,220.85.

17. That the probable cost of proposed improvements, needed to make the system adequate for the present needs of the city, will be $85,000, exclusive of expenditures made by the receiver, and that such improvements and changes contemplate the river as a permanent source of supply.

389 18. That the present estimated value of the available portion of the system with the river as a source of supply is $176,562.62.

19. (This clause has reference to rentals and is not material here.)"

The Master's summary of his conclusions of law is stated as follows:

"1. I have concluded that the city had the power to enter into the contract, provided no State or Federal law was violated.

2. That the contract did not create a debt in violation of the Constitution of Georgia.

3. (This finding is immaterial here.)

4. That the grant of the franchise is to be construed as meaning that the City would not enter into competition with the Water Company as long as the contract for supplying water to the city could be complied with on the part of the company, and that the grant was permissible as an incident to the performance of the principal undertaking.

5. That the Act of 1902 is not a revocation of the franchise as defined in this contract.

6. That the City in the exercise of its police power could enact the ordinance now sought to be set aside, but with limitations as to the rights of the Water Company and its creditors as may be determined by the court.

7. That the acceptance of the works was conditional, and the company not having fulfilled its assurances of complying with the contract, and that without fault on the part of the City, the latter is not estopped from constructing a system of its own.

8. That the City is released of its reciprocal obligations by reason of the continued default of the company.

9. That the City could not in its execution of the contract in 1881 bind future administrations to purchase. The clause is to be construed as conferring a privilege of purchase and nothing more.

10. That the valuation of the system should be fixed at cost of reproduction and ten per cent. added for present connections with and supply of buildings.

11. That the contract with the City should be rescinded and injunction denied, and that the bondholders are not entitled to continue operating the works under the contract.

12. (The 12th finding is also immaterial here.)

As to the peculiar rights of the bondholders in this case the Master, after some discussion of the matter, concludes as follows:

"I conclude:

1. That the holders of the bonds of the Columbus Water Works Company have no greater legal right than the company to a continuance of the present contract, and the company having failed to perform its conditions, and the City being entitled to a cancellation thereof, as against the company, it has a similar right against the bondholders who have no legal right to a continuance of the contract for their benefit.

2. That the City of Columbus is entitled to have said contract rescinded and declared set aside and annulled, and that it should be permitted to carry out the purpose of the ordinance of September 14, 1902, for the construction and operation of a system of water works.

390 3. That the Water Company is not entitled to the enforcement of the specific performance of its contract, nor of the validation thereof, nor to an injunction against the city's carrying out of the purposes of its ordinance."

The Master then makes the following recommendations based on his findings of fact and of law:

"Reviewing the several findings of fact, and conclusions of law and fact as applicable to this case on its merits, I have to submit, in conclusion, the following:

The case is before the court under proceedings brought about by the Trustee moving against the Columbus Water Works Company in the interest of the holders of bonds of the Company. Both the plaintiff and defendant in the foreclosure proceedings are parties to the present bill. The City, as defendant herein, is applying through a cross bill for affirmative relief. The court is in control of and operating the property. Connected with the legal questions involved is the grave question of supplying the population of a large and rapidly growing city with wholesome and abundant water for domestic and sanitary uses and for protection of property. 'The consideration of public interest will largely influence a court of equity when property upon which an entire city is dependent for its water comes into the power and under control of the court.' Joy *et al. v.* City of St. Louis, 138 U. S. 1, 34 L. Ed. 843. On the other hand the bondholders, the real parties at interest as to the disposition of the property in litigation, have supplied all the funds both for the original purchase and enlargement of the works, to the extent they have been enlarged. It is true they assume the risk of the investment, and their legal rights are no higher than those of the Water Company, but there may be an equity in their favor. There are portions of the system, lying within the City of Columbus, which could possibly be made available for the future uses of the City from whatever source her water supply is drawn. While the City is entitled to a recission of the contract and may proceed to construct her own water system, such a system operated independent of that of the Water Company would without doubt greatly

destroy, if not render entirely valueless, the property to which these bondholders now look for the security of their bonds. Would it not be in accordance with equity and good conscience to require the City, in view of all the facts developed in this case, to utilize this available portion of the system at its reasonable and fair value and the proceeds be appropriated for the benefit of the holders of the bonds? The court having jurisdiction, and having power to do, under the present bill, whatever may be necessary or proper to fully protect the rights of all and do equity between the parties, can mould a decree which will work no injustice. Whatever be the value of the present water works property any portion of it which can be of use to the City in the construction and operation of future water works should be made available for that purpose, and the net proceeds thereof should in equity be applied for relief to that extent of the holders of bonds of the Water Company. It would be manifestly unjust and inequitable to allow the City to proceed unconditionally with its plan to provide the inhabitants with water and not protect the interests of these bondholders to the extent, at least, of the value of such portions of the system as may be available for the City's use. To quote the language of one of the able counsel for the complainant: 'They (the bondholders) are entitled to be protected to the extent of the value that is there.' While he referred to the value of the entire system, the statement is equally applicable to the portion which may be available for the City's uses. The bondholders have proposed to sell the present system to the City at a fair valuation. The City contracted for
391 the privilege of purchasing the system, and while I have found this not to be a binding legal obligation of purchase it may in equity be enforced to the extent of requiring a purchase of such parts of the system as the City may now use. I have found that the portions lying in the State of Alabama are of no practical value. The valuation I have found is applicable only in case the river is to be used as a source of supply, and I have found that this was not in the minds of the parties when the contract was entered into.

A decree in this cause refusing injunction and declaring the contract annulled and cancelled should not be unconditional. The available property need not be necessarily lost to the bondholders, if they be willing to save it upon the terms decreed by the court. They could be permitted to accept from the City a fair valuation thereof and the City could be required to pay the same before proceeding to carry out the purposes of its ordinance. If, on the opportunity being afforded, the complainant, trustee for the bondholders, declines to accept the valuation fixed by the court and convey to the City the available part of the system, then the City should be permitted unconditionally to proceed with its undertaking.

I therefore recommend:

1. That in order to ascertain what may be the value of the portion of the system located in the State of Georgia, so far as the same can be utilized by the City to supply such a distribution system

as would be adequate for the needs and purposes of the City in the construction and operation of a water works system, a special reference be had to take testimony of experts upon this question and that a report be had thereon.

2. That on such report being made the City be required, in terms of a conditional decree, to pay into court for the use of the trustee, complainant in this cause (subject to prior payments as may be decreed), the sum ascertained by said report, said payment to be made within a day specified after the filing of written consent on the part of the trustee for the bondholders to accept said amount in satisfaction of all interest and claim of right which said bondholders allege as existing under the outstanding bonds of the company or otherwise.

3. That thereupon the lien attaching by virtue of the trust deed, or otherwise, held by the complainant to secure the bonds of the water company, so far as the same applies to the property of the company within the corporate limits of the City of Columbus, Muscogee County, State of Georgia, and found under said reference to be of use to the city, be released and cancelled, and that the Columbus Water Works Company, and the Mercantile Trust & Deposit Company of Baltimore, execute and deliver to the City of Columbus a conveyance of all said property, free from all liens and encumbrances under said trust deed and mortgage, and that the trustee be required to so enter upon said deed, and upon the several bonds on deposit with it and those held for the committee of bondholders in this cause, and that the holders of such bonds as have not been so deposited or held shall be estopped from setting up any claim or lien upon the property so conveyed, and further that the eight bonds held by the Receiver be surrendered and cancelled, and Receiver's certificates be substituted therefor as collateral for the outstanding indebtedness secured by said bonds.

4. That out of the funds decreed to be paid into court there shall first be paid any sums necessary for redemption of all outstanding certificates of the Receiver, and such other sums as may be proper to be paid after an accounting has been had of the indebtedness of the Receiver, and that the property above named be declared free of all lien of Receiver's certificates and all other liens.

392 5. That the affirmative relief as prayed in the cross bill of the City be granted, and that the City be allowed, after the deposit of the aforesaid amount, to proceed to carry out the purposes of the ordinance providing for its water works system.

6. (The 6th recommendation is immaterial here.)

7. That the cost of the litigation be taxed equally between the parties.

8. That in the event the City fail to pay in the amount on the day specified as provided in the second paragraph herein, when written acceptance is filed by the Trustee as required, then injunction issue against the City, and the bondholders be permitted to carry out the contract as prayed in their amendment to the bill, and all costs be taxed against the City; but in the event the acceptance of

the Trustee is not filed, as required, then the bill of complaint be dismissed and the City permitted to proceed to carry out the purposes of its ordinance of September 1902, and all costs to be taxed against the complainant."

The principal legal questions controlling in this case are, (1) Whether the City under its charter had the authority to contract for a supply of water for the city and its inhabitants; (2) Whether the contract in this case created a debt in violation of the Constitution of the State of Georgia; and (3) Whether the exclusive character of the contract in this case can be upheld.

It is well settled in Georgia, as held by the Master, and as determined by Circuit Judge Pardee in the case of Columbia Avenue &c. Trust Co. *v.* The City of Dawson, *supra*, that cities have the power under the "general welfare" clause of their charters, to enter into contracts for a water supply for their inhabitants for domestic use and for fire protection. Mayor and Council of Rome *v.* Cabot, 28 Ga. 50; Wells *v.* Mayor and Council of Atlanta, 43 Ga. 67; Grace *v.* Hawkinsville 101 Ga. 553.

That the action of the city council of Columbus in entering into this contract did not create a debt in violation of the Constitution of the State is also held by the Master in this case, following the decision in the Dawson case. After quoting from the report of the special master, approved by Judge Pardee, in the Dawson case, it was said in this case on the former hearing, (130 Fed. 184):

"From these citations it will be seen that the decisions of the Supreme Court of the state were quite as favorable to the validity of the contract in this case as they were at the time of the con-
393 tract in the Dawson case. If in that respect there is any distinction in the two cases, it is favorable to the complainant here."

The views of the court in the Dawson case, and in this case when the former decision was made, are well expressed by the Master in the Dawson case, in this language, (130 Fed. 171):

"It cannot therefore fairly be said that there was such a settled course of judicial decisions in Georgia on this question at the time of the making of the contract, as to constrain the courts of the United States to follow later decisions of the state court, especially in a case where the rights of innocent third parties are concerned."

The decisions of the supreme court of the State of recent years have been to the contrary, but this could not affect the contract if, at the time it was made, the decisions of the supreme court were as stated. I see no reason for departing from what was held in the Dawson case, and what was before held in this case as to this question.

The next, and perhaps most important legal question involved in this case is that of the exclusive character of the contract. When this case was before the court on the application for injunction *pendente lite*, the Walla Walla case, (172 U. S. 1) was the most important and controlling case on the subject of the exclusive character of such contracts as this. Since that time a number of decisions have been made. The three most recent cases are Knoxville Water Co. *v.* Knoxville, 200 U. S. 22, Vicksburg *v.* Vicksburg Waterworks Co. 202

U. S. 453, and the quite recent case of Water, Light and Gas Company of Hutchinson *v.* The City of Hutchinson, 207 U. S. 385. These three cases cite quite a number of preceding cases, none of which need be discussed here in the view that is taken of the question as determined by the facts of this case, and of the contract under consideration.

In the Knoxville case it is held by a majority of the Supreme Court, (four Justices dissenting) that an agreement on the part of a city with a water works company not to enter into a contract with any other parties for the establishment of water works during the period of the contract, did not prevent the city itself from erecting water works.

394 In the Vicksburg case it was held that the exclusive character of the contract entered into in that case prevented the city from entering into competition with the water works company by the erection of water works of its own.

In the Hutchinson case, the decision seems to have been based on local statutes and decisions of Kansas, and it was determined by the Supreme Court that under those statutes and decisions the City of Hutchinson was not authorized to enter into an exclusive contract.

The case here is more nearly like the Vicksburg case. Assuming, as I have, that the city had authority, under the general welfare clause in its charter, to enter into this contract, and that it did not, as the decisions stood at the time the contract was made, create a debt in violation of the Constitution of the State, there is nothing, so far as I have been able to see, and certainly nothing has been brought to the attention of the court, under the statutes and decisions of this State, which would prevent the City of Columbus from making an exclusive contract for a limited period, if that contract was a necessary and indispensable incident to the contract for a supply of water. That such a grant of an exclusive privilege was necessary and indispensable to the main undertaking of the city, seems to me to be beyond question. Considering the size of the city of Columbus at the time this contract was entered into, and the number of its inhabitants, it would have been an impossibility to have had any one enter into a contract of this sort, if the parties so contracting were to be met immediately, or soon thereafter, with competition from another water works company or from the city itself engaging in the business of supplying water to the city and its inhabitants. Such a contract would have been utterly valueless and no one would have undertaken the expenditure necessary for the establishment of such a system of water works as was contemplated by this contract, and was actually established, unless they had been guaranteed an

395 exclusive right for some reasonable period at least, for rendering the service and receiving the return expressed in the contract. Competition from other parties, or from the city, would of course have destroyed the entire value of the outlay. It is clear that responsible parties would not have entered into any such contract except for its exclusive character. This being true it comes within the decision in the Vicksburg case. (202 U. S. 453.) The language of the Court in that case, in the opinion by Mr. Justice

Day, is so pertinent here that I quote from it at some length, as follows:

"The contract in the respect under consideration is found in section 1 of the ordinance, and undertakes to give to Bullock & Company, their associates, successors and assigns, the exclusive right and privilege, for the period of thirty years, from the time the ordinance takes effect, of erecting, maintaining and operating a system of waterworks, with certain privileges named, for the furnishing of a supply of good water to the City of Vicksburg and its inhabitants, for public and private use.

Without resorting to implication or inserting anything by way of intendment into this contract, it undertakes to give by its terms to Bullock & Company, their associates, successors and assigns the exclusive right to erect, maintain and operate waterworks, for a definite term, to supply water for public and private use. These are the words of the contract and the question upon this branch of the case is, conceding the power of the city to exclude itself from competition with the grantee of these privileges during the period named, has it done so by the express terms used? It has contracted with the company in language which is unmistakable, that the rights and privileges named and granted shall be *exclusive*. Consistently with this grant, can the city submit the grantee to what may be the ruinous competition of a system of waterworks to be owned and managed by the city, to supply the needs, public and private, covered in the grant of privileges to the grantee? It needs no argument to demonstrate, as was pointed out in the Walla Walla case, that the competition of the city may be far more destructive than that of a private company. The city may conduct the business without regard to the profit to be gained, as it may resort to public taxation to make up for losses. A private company would be compelled to meet the grantee upon different terms and would not likely conduct the business unless it could be made profitable. We cannot conceive how the right can be exclusive, and the city have the right at the same time to erect and maintain a system of waterworks, which may and probably would practically destroy the value of rights and privileges conferred in its grant. If the right is to be exclusive, as the city has contracted that it shall be, it cannot at the same time be shared with another, particularly so when such division of occupation is against the will of the one entitled to exercise the rights alone. It is difficult to conceive of words more apt to express the purpose that the company shall have the undivided occupancy of the field so far as the other contracting party is concerned.

The term "exclusive" is so plain that little additional light can be gained by resort to the lexicons. If we turn to the Century Dictionary, we find it defined to mean 'Appertaining to the subject alone; not including, admitting or pertaining to any other or others; undivided; sole; as, an exclusive right or privilege; exclusive
396 jurisdiction.' We think, therefore, it requires no resort to implication or intendment in order to give a construction to this phase of the contract; but on the other hand, the city has

provided and the company has accepted a grant which says in plain and apt words that it shall have an exclusive right, a sole and undivided privilege. To hold otherwise in our view would do violence to the plain words of the contract, and permit one of the contracting parties to destroy and defeat the enjoyment of a right which has been granted in plain and unmistakable terms. On the authority of the Walla Walla case, the city had the power to exclude itself for the term of its contract, giving the words used only the weight to which they are entitled, without strained or unusual construction, and we think it was distinctly agreed that for the term named the right of furnishing water to the inhabitants of Vicksburg under the terms of the ordinance was vested solely in the grantee, so far at least as the city's right to compete is concerned. Any other construction seems to us to ignore the language employed and to permit one of the parties to the contract to destroy its benefit to the other. We think the court below did not err in reaching this conclusion."

The above language appears to be conclusive of the question before the court in this case. The contract in that case was exclusive and in this case it is exclusive. It was for thirty years in both cases. I do not see either, any material difference between the local law in Mississippi and the law in Georgia at the time the Columbus contract was entered into. My conclusion, therefore, is that the exclusive feature of this contract must be upheld.

It may be proper, however, in this connection to consider the effect of certain provisions of the Constitution of Georgia, which were relied upon by counsel for the City. Article 1, Section 3, Par. 2, of the Constitution of the State of Georgia of 1877, provides that:

"No bill of attainder, *ex post facto* law, retroactive law, or law impairing the obligation of contracts, or making irrevocable grants of special privileges or immunities, shall be passed."

The succeeding paragraph 3, provides:

"No grant of special privileges or immunities shall be revoked, except in such manner as to work no injustice to the corporators or creditors of the incorporation."

The provision of the Constitution of the State of Mississippi is as follows:

"Corporations shall be formed under general laws only. The legislature shall have power to alter, amend or repeal any charter of incorporation now existing and revocable, and any that may hereafter be created, whenever in its opinion, it may be for the public interest to do so; provided, however, that no injustice shall be done to the stockholders."

397 The Supreme Court, in the opinion in the Vicksburg case, (202 U. S. 464-465) after referring to the fact that the Constitution in which this provision occurred was adopted in 1890, and the contract in that case was created by an ordinance which was passed in 1886, refers to the case of Hamilton Gas Light & Coke Co. *v.* City of Hamilton, 146 U. S. 258, and proceeds in this language:

"Furthermore, the Mississippi Constitution contains this provision which is not in the Ohio Constitution considered in the Hamilton case, namely, 'Provided, (in exercising the right of amendment or repeal of a charter) no injustice shall be done to the stockholders.' If it be true that the complainant below had a binding contract excluding competition by the city in furnishing a water supply for the period of thirty years, we think it would be a palpable injustice to the stockholders to permit the competition of the city by new works of its own; which whether operated profitably for the municipality or not, might be destructive of all successful operation in furnishing water to consumers by the private company."

I think this citation of authority alone sufficient without referring to other cases in which similar clauses in State constitutions are discussed. The effect of the action of the City of Columbus on the creditors and bondholders of the water works company will be hereinafter referred to.

The Master discusses the question raised by counsel for the city as to the right of the City, in the exercise of its police power, to provide for another supply of water. He concludes that the city has such right, subject to certain rights of the Water Company and its creditors, which he discusses later.

Assuming, therefore, that this is a valid contract, binding upon the city, and that the city was precluded thereby from entering into competition with the Water Works Company by erecting a system of its own, we come now to the question of whether or not the Water Works Company on its part has complied with its contract. I do not agree with the Master entirely as to some of his findings in this respect. It seems to me, under the facts as shown by the evidence, that when the city council was informed that the water works system had been completed, and the council with the aid of experts, examined the system and expressed its satisfaction and approval, it could not afterwards set up defects in the original construc-
398 tion of the system; so that as to the sufficiency of the reservoir, mains, filters, &c., I should be disposed to disagree with the Master, but as to the Master's finding that there was a failure to furnish an abundant supply of pure and wholesome water, the facts in evidence before him justified his findings, particularly as to September, 1902. While there were some failures before that to give the city and the people all that they ought to have had in this respect, these failures were passed over by the city, and as a rule the trouble was remedied, and the satisfaction of the city council expressed in the changes and improvements made. The people of the city twice refused during the contract, in 1894 and in 1897, to vote by the necessary two-thirds majority in favor of the issuance of bonds by the city for the erection of a waterworks system of its own. Although there had been complaints from the time of the completion of the waterworks in 1882 until 1889, the Master found that in 1889 the system had been improved to such an extent that it was accepted as satisfactory to the city. For several years there were

negotiations between the city and the Water Works Company with reference to supplying water to additional territory which had been taken into the city, and these negotiations appear to have resulted in a practical agreement in 1900, although there were some few items of disagreement. The Master's finding as to the condition from 1889 to 1900, is expressed as follows:

"I find that from 1889 to May 1900, except at comparatively short intervals, there was dissatisfaction and complaints on the part of the city because of insufficiency of the water supply, and especially with the unsupplied needs of the city for water in its annexed territory; that the company had notice of this and recognized the necessity of increased supply. I further find that during this period the differences between the company and the city led to an effort by the council on two separate occasions to repudiate the contract, but that it was not sustained by the requisite popular vote, thereby indicating the desire of the people to give the company an opportunity to carry out the terms of the contract; that the company in apparent good faith endeavored to adjust the differences by offer to arbitrate and the council declined, and that finally the council accepted existing conditions and concluded a supplemental agreement by which the company was given an opportunity to test its ability to fully meet the requirements of the contract; and that in 1902 both the council and the people determined to no longer depend upon the Water Company."

399 The source of supply of water selected by White, and accepted as has been stated, by the City, was in Alabama, four miles west of Columbus. A reservoir was first constructed of stone, and afterwards, in 1885, a second or upper reservoir, immediately above the lower and first reservoir, was constructed by building a dam across the upper end of the first reservoir. The real difficulty, as gathered from the evidence, seems to have been the inadequacy of the supply, and also the failure on the part of the company to construct the upper reservoir as it should have been. The Master finds that when the stream supplying these reservoirs became abnormally low, and the upper and lower reservoirs not properly supplied, that the water became stagnant and impure, and greatly limited in quantity. He finds that this condition existed in 1894, 1895, 1898 and 1899, and notedly so in 1902. The serious condition which existed in 1902 led unquestionably to the action of the people of the city in voting almost unanimously in favor of the issuance of bonds, which is in controversy here. Of course one of the conditions, and perhaps the main condition, which caused the trouble in 1902, was an unusual d-ought. This condition really existed again in 1904 for a short time, and would have been serious perhaps but for the prompt action of the Receiver, under the authority of the court, in remedying the difficulty by arranging to obtain water from the Chattahoochee river at a point above contamination.

There may be some merit in the claim made by counsel for the complainant that the action of the city council, and of the people, interfered to some extent with the ability of the Water Works Company to carry out its contract. This, if true, was mainly so as to the

agitation in the city council and among the citizens on the subject of municipal ownership, thereby affecting the credit of the Water Works Company and its ability to make further improvements. But even making some allowance for this, in my judgment the facts in evidence were sufficient to justify the Master in finding that there was a failure on the part of the company to furnish an
400 abundant supply of pure and wholesome water as provided in the contract, and finding the company at fault in this respect.

It is a serious matter to undertake to supply the inhabitants of a city with an ample supply of good and wholesome water, and persons entering into a contract to do this necessarily must do so with an understanding of the important character of the undertaking. This is particularly true of a growing city. Taking this whole record together, and considering all the evidence, the Master, as has been stated, was justified in reaching the conclusion that there was a failure to comply with the contract in this respect.

The prayer of the cross-bill filed by the City is that it have a decree annulling the contract with the Water Works Company, and that the cross-defendants be perpetually enjoined from setting up any right or interest thereunder. This would be in effect decreeing a forfeiture of the Water Works Company's rights under its charter and under the ordinances of the City, and under its contract. This will not be done in a court of equity, and certainly not except upon the same conditions that the prayer of the complainants in the original bill for an injunction will be denied. It should not be done unconditionally in any event, and clearly not as against the bondholders. Substantially and practically the action of the court in either finally granting or denying the injunction will settle the rights of the parties in this case, so that a decree upon the cross-bill is really unnecessary, even if it is allowable.

I come now to the consideration of the recommendation of the Master as to the conditions upon which a final decree denying the injunction sought by the complainant, should be entered. As shown by the record in this case, on December 22nd, 1902, a bill was filed by the Mercantile Trust & Deposit Company of Baltimore, trustee for the bondholders, against the Company. William S. Greene was appointed receiver, and permission was granted the receiver to issue $50,000 of receiver's certificates, the trustee for the bondholders consenting thereto, for the purpose of making improvements to
401 the waterworks plant. The receiver assumed charge on January 15th, 1903. At the time the report of the Master was filed the receiver had expended $47,220.85 in improvement of the plant, the larger part of which was for a filter plant and pumping station. Since that time the receiver has expended a considerable additional amount in improvements. From the time he took charge the receiver has, with one exception, been furnishing the city with fairly good water and with a sufficient supply of the same. The exception was in the summer of 1904, during a protracted drought, when the streams in Alabama were almost dried up and the Chattahoochee river very low. The main difficulty was that the intake was at a point below where there was some contamination of the river. This

was promptly remedied, and since that time there has been no complaint, at least none has been brought to the attention of the court.

The bondholders acting through their committee, have done everything reasonably within their power to make the present waterworks system effective and satisfactory. I am not satisfied that under the facts of this case it is brought within the ruling of the supreme court in Farmers Loan & Trust Co. *v.* The City of Galesburg, 133 U. S. 156. In that case it was held that the rights of the bondholders were no higher than those of the company, the decision being based of course on the facts of that case. In this case the city has for five years accepted and received the benefit of the efforts of the bondholders to give the city a good supply of water. While of course the bondholders were interested in protecting their security, the result of the work and improvements, for which they furnished the funds, has been to give the city what is conceded I think by all parties to be at least a fairly good supply and quality of water. They must continue to do this until the end of this litigation, whenever that may be, for the idea could never be entertained of allowing the waterworks to be stopped and the city left practically without water, as it would be now unless this system was continued. The
402 maxim "He who seeks equity must do equity," is applicable here. I conclude that not only in justice and fairness, but testing the matter by sound principles of equity, the city, as against these bondholders, should be required to take so much of this waterworks plant as may be hereafter determined, at a fair valuation, as a condition of, and before entering a decree in its favor finally denying an injunction in the case against the issuance by the city of its waterworks bonds.

The Master finds that the present estimated value of the available portion of the system, with the river as a source of supply, is $176,562.62. This does not include the value of that portion of the company's property in Alabama, including its lands, reservoirs, pipes and right-of-way in Alabama. It seems to me that it would be impracticable to detach this portion of the system from the other, in the manner suggested by the Master. The Alabama property must be in any view of it, of considerable value, and for some time to come, allowing for any direction this case may take, it should and doubtless will be used as a partial source of supply. There is a provision in the contract that,

"At the end of fifteen years from the completion of the works the city shall have the right to purchase the same with all the rights, franchises and property at a price to be mutually agreed upon, or the valuation may be ascertained by three disinterested non-residents of Columbus or Muscogee county, one to be a hydraulic engineer—the city to appoint one arbitrator, White one, and these two to select a third. When the value of the works is thus acertained and declared, the city shall pay the sum named with ten (10) per cent. added; and the city shall, in this purchase, assume all the obligations of White, the lawful acquittances of which shall be received by White as a part of the cash payment of the declared value of the water works. The obligations include such as are for operating,

maintaining and extending the same, and the duties incident thereto. In assuming money obligations for indebtedness, or choses in action, due from White to others, the same shall be in lieu of cash payments to equal amounts, and no obligation to assume money liabilities greater than the value to be paid by the city; but the city has the right to decline the purchase after the value is ascertained upon payment of expenses of arbitration. If the city does not buy on this valuation when ascertained the right and privileges of White shall continue in force until the final purchase of the works by the city. The right to purchase shall inure to the city every 15 years, but in every case White is to have 12 months previous notice of the city's intention to purchase."

403 In my opinion this provision of the contract adds to the duty of the city to take this waterworks plant at a fair valuation, as it was clearly in the minds of the parties, the city and White, the assignor of the Columbus Water Works Company, that if the city should desire to establish municipal ownership it might take this plant at a fair valuation. It adds something at least, to my mind, to the equities of the bondholders in the present situation.

I can understand and appreciate fully the desire of the authorities and of all the people of Columbus for an adequate supply of good water. Nothing is more necessary to the welfare and comfort of the people. They are entitled to this and should have it. But there is no reason whatever why the present water works plant, or certainly the greater part of it, cannot be utilized in connection with any new source of supply that may be resorted to by the city.

I agree substantially with the recommendation of the Master stated above as to the terms upon which a decree denying an injunction should be entered, except that I think it should be conditioned upon paying the fair value of such property of the company, that is the whole or a part as the court may decree, after ascertaining in proper manner the value now of the property in Georgia, and the value of the entire property with that in Alabama added. Considerable additions and a number of improvements have been made to the property in Columbus since the Master's report. The city should have the option, however, of having the value of the property submitted to arbitration, as provided in the contract, in case it should elect to do so. This arbitration should fix the value in the manner just mentioned, that is the value of the property in Georgia, and the value with the property in Alabama added, so that both valuations will be before the court.

Before a final decree is entered in this case a reasonable time should be given the city authorities to consider the matter

404 and determine what action they think it advisable to take. This litigation has already been greatly protracted, and probably sixty days' time for this purpose will not be unreasonable, and no final decree will be entered for that time.

This April 25th, 1908.

WM. T. NEWMAN,
U. S. Judge.

Filed in clerk's office April 25, 1908.
O. C. FULLER, *Clerk*,
By N. A. BROWN, *Deputy*.

405 *Petition of Respondent for Final Decree to be Entered.*

In the Circuit Court of the United States for the Northern District of Georgia, Western Division.

No. 59. In Equity.

MERCANTILE TRUST & DEPOSIT COMPANY OF BALTIMORE, Trustee,
v.
THE CITY OF COLUMBUS ET AL.

Bill.

THE CITY OF COLUMBUS
v.
MERCANTILE TRUST & DEPOSIT COMPANY OF BALTIMORE, Trustee, ET AL.

Cross Bill.

Now comes the City of Columbus defendant and cross-complainant in the above entitled causes and represents to the court as follows, towit:

First. That heretofore, to-wit, on the 25th day of April, 1908, this honorable court rendered a decision and handed down an opinion in the above entitled causes, in which opinion it was declared among other things that a decree denying the injunction as prayed for by the complainant should be entered upon the condition that the City should pay the fair value of such property of the Columbus Water Works Company as might be thereafter ascertained, and that the City should have the option of having the value of the property submitted to arbitration as provided in the contract in case it should elect so to do. In such opinion it was further declared that before a final decree is entered in this case a reasonable time shall be given the City authorities to consider the matter and determine what action they think it advisable to take, and for this purpose the court allowed sixty days.

406 Second. That the matter was brought to the attention of the City of Columbus, and at a meeting held on May 6th, 1908, the City acting through its board of Mayor and Aldermen adopted a resolution respectfully declining to accept a decree upon the conditions imposed, and directing counsel for the City to make application to the Court to enter such decree as will permit the City, pending an appeal to the Supreme Court, to proceed to construct a system of water works of its own, but not to operate such system in competition with the present water works system unless and until a

favorable decision should be obtained in the Supreme Court, or the old contract with the Water Works Company should expire by its terms. A certified copy of this resolution is hereto attached and leave of reference thereto is hereby prayed.

Wherefore, the City of Columbus by its counsel submits this its application and prays the Court to enter such a decree as will permit the City to proceed with the construction of its own system of water works, but not to operate the same, or any part thereof until the expiration of the old contract, or until otherwise ordered by the court.

T. T. MILLER,
WIMBISH, WATKINS & ELLIS,
Solicitors and of Counsel for The City of Columbus.

COUNCIL CHAMBER.
COLUMBUS, GA., *May* 6, 1908.

Alderman Dismukes offered the following resolution, which was adopted:

"The attention of this body being called to an interlocutory order of the judge of the district court of the United States, in the case of the Mercantile Trust & Deposit Co., of Baltimore, *vs.* The City of Columbus *et al.*, pending in said court, in which order it is proposed that before entering a decree denying the injunction as prayed
407 for, that the City of Columbus be required, at a fair valuation, to purchase either the whole or a part of the system of waterworks owned and operated by the Columbus Water Works Company, as may be hereafter determined by the court; and said order providing further that in the event of the City of Columbus declining to accept such conditions imposed, that a decree be entered granting an injunction, as prayed for in the proceeding; and

Whereas, this body is in receipt of a communication from the board of water commissioners at a called meeting held on the 4th day of May, 1908, at which meeting the attorneys representing the City were present, and requested this body to take action, requesting the court to enter a decree at once but so modified pending an appeal to the Supreme Court of the United States as will permit the City to sell its bonds, and proceed to construct a system of waterworks of its own; but not to be operated until a favorable decision of said Supreme Court or the expiration of the contract with Thos. R. White, and assigned to the Columbus Water Works Co., which expires in September, 1911, so that said City may at the expiration of said contract be ready to operate its own system, in case it may choose to do so.

It is therefore resolved by the Mayor and Board of Aldermen of the City of Columbus as follows:

1. That this body is heartily in sympathy with the resolution adopted by the Board of Water Commissioners; and that the attorneys representing the City be, and they are hereby, requested to have the judge of said court enter a decree without delay of sixty days or any considerable time but so modified as to permit the City to sell its bonds and construct a system of waterworks of its own,

not to be operated pending an appeal to the Supreme Court of the United States or until the expiration of the contract now existing between said City and the Columbus Water Works Co., which expires in September, 1911.

408 2. Be it further resolved, that the attorneys representing said City be, and they are hereby, requested upon entering said decree that they enter an appeal therefrom to the United States Supreme Court, as it is the sense of this body that the City is entitled to an unconditional decree in its favor denying said injunction; and that said attorneys are hereby authorized to prosecute said appeal, as by statute in such cases made and provided."

COUNCIL CHAMBER,
COLUMBUS, GA., *May* 9, 1908.

I, M. M. Moore, Clerk of Council of the City of Columbus, Ga., hereby certify that the foregoing is a true extract from the minutes of the Board of Mayor and Aldermen of said City for the date named.

Witness my hand and seal of said City this 9th day of May, 1908.

[Seal Corporation of the City of Columbus, Georgia.]

M. M. MOORE,
Clerk Council.

Filed in clerk's office May 23rd, 1908.
O. C. FULLER, *Clerk.*
By J. D. STEWARD, *Dep. Clk.*

409 *Final Decree.*

In the Circuit Court of the United States for the Northern District of Georgia, Western Division.

No. 59.

MERCANTILE TRUST & DEPOSIT COMPANY OF BALTIMORE, Trustee,
v.
THE CITY OF COLUMBUS ET AL.

Bill in Equity.

THE CITY OF COLUMBUS
v.
MERCANTILE TRUST & DEPOSIT COMPANY OF BALTIMORE, Trustee, ET AL.

Cross Bill.

This cause came on to be heard at this time on exceptions to the report of the master, and upon final hearing of the cause for the determination of the questions of law and fact, and the rendition of a final decree, and was argued by counsel.

And thereupon, upon consideration of the exceptions to the report of the master, the findings and conclusions of the master are modified in those respects and in those particulars, and to the extent set forth in the opinion of the court heretofore rendered and filed in said cause on April 25th, 1908, and it is further ordered, adjudged and decreed by the court in accordance with the conclusions and rulings of the court set forth at large in said opinion.

And it is ordered, adjudged and decreed by the court:

That the contract between Thomas R. White and the Mayor and Council at Columbus, dated October 7th, 1881, a copy of which is annexed to the bill of complaint, marked Exhibit "B", was a valid and binding contract between the said Thomas R. White, his successors and assigns, the Columbus Water Works Company, and the City of Columbus.

410 That the Columbus Water Works Company, the successor of Thomas R. White, constructed the system of waterworks called for by the contract under the provisions of the contract, and on October 31st, 1882, said Columbus Water Works Company, as successor and transferee of the said Thomas R. White informed the Mayor and Council of the City of Columbus that said Company had completed the system of waterworks in accordance with the contract, and that the water was ready for distribution and use under the terms of the contract, and requested formal acceptance of the work by the City; and thereafter, on November 6th, 1882, by resolution of the Mayor and Council, the City of Columbus signified its acceptance of the waterworks, as having been completed by the Columbus Water Works Company, in accordance with the aforesaid contract made between said Mayor and Council, and Thomas R. White on the 7th day of October, 1881, and subsequently, on the 3rd day of April, 1882 transferred to the Columbus Water Works Company. And by said resolution, said City of Columbus accepted the water works, and from the date of said acceptance continued to accept and receive the water and fire protection furnished by said Water Works Company under the aforesaid contract.

That the City of Columbus had authority to make the contract; that the contract did not create a debt in violation of the Constitution of the State of Georgia, and was not invalid by reason of its exclusive feature, or for any other reason.

That, by virtue of Article XIV of the contract, the Columbus Water Works Company, successor and assignee of Thomas R. White, was granted the exclusive privilege of maintaining and operating water works in the City of Columbus for the period of time mentioned in the contract, and that the City of Columbus was thereby precluded from entering into competition with the Water Works Company, by erecting, maintaining and operating a system of its own during the continuance of the contract.

411 That the complainant, The Mercantile Trust and Deposit Company, as trustee for bondholders under the mortgage of January 1st, 1891, a copy of which is annexed to the bill, marked Exhibit "A", is entitled to the rights, benefits and provisions of the aforesaid contract with the City of Columbus.

That Williams S. Greene, the Receiver of this Court in the cause under the bill filed in this court on December 22nd, 1902, by the said Mercantile Trust & Deposit Company of Baltimore, as Trustee, against said Columbus Water Works Company, has expended large sums of money in improving the plant of the company, including the erection of a filter plant and pumping station, and the complainant and the bondholders represented by complainant have done everything reasonable to make the present water works system effective and satisfactory.

That the City has, the five years last passed, accepted and received the benefit of the efforts of the bondholders to give a good supply of water, and through their receiver is continuing so to do.

That the City of Columbus as against complainant and the bondholders represented by complainant, should in equity be required to take the waterworks plant or so much of the waterworks plant as may hereafter be estimated at a fair calculation, to be ascertained by arbitration in the manner provided in the contract, whenever the City shall elect so to do, or to be ascertained by experts appointed by the Court in the event the City should desire to establish municipal ownership, and as a condition to its right so to do. And leave is hereby granted to the City of Columbus to apply to the Court for the appointment of said experts and for such supplemental decree as may be necessary to carry into effect this provision.

And until the valuation so ascertained by either of the methods heretofore stated is paid to the complainant, in accordance with such supplemental decree, the City of Columbus, the Mayor and Council thereof, and the water works commission, and officers, servants and agents of said City of Columbus, are enjoined and strictly restrained in taking further action towards the issuance or sale of bonds for the purpose of establishing a water works system by the City, and from erecting, maintaining or operating waterworks, or from supplying water for fire protection or other municipal purposes, or laying, or permitting the laying of mains or other water works or water pipes, or construction of water works in violation of the aforesaid contract.

412

And it is ordered that a writ of injunction issue in accordance with this decree.

Provided that it is not intended by the foregoing decree to prohibit or restrain the City of Columbus or its Mayor and Council or the Board of Water Commissioners from taking such steps, doing such work and making such expenditures as said City or City authorities may desire for the purpose of obtaining a new or additional source of supply of water, and to that end and for that purpose the City may issue under any law or ordinance now of force or that may hereafter be passed, not exceeding one hundred thousand dollars of municipal bonds.

The Court hereby expressly reserves the right and power to so modify this decree and enter such further orders as may hereafter be deemed appropriate and consistent with the principles of equity.

The relief prayed in the cross bill of the City of Columbus, if

legally grantable, is deemed unnecessary for the reasons stated in the opinion and is denied.

And it is ordered, adjudged and decreed, that complainant do have and recover of the defendant, the City of Columbus, costs of court in this cause, to be taxed by the clerk.

In open court this 3rd day of June, 1908.

WM. T. NEWMAN,
U. S. Judge.

Filed in clerk's office June 3, 1908.

O. C. FULLER, *Clerk,*
By N. A. BROWN, *Deputy.*

413 *Petition for Appeal.*

In the Circuit Court of the United States for the Northern District of Georgia, Western Division.

No. 59. In Equity.

MERCANTILE TRUST & DEPOSIT CO. OF BALTIMORE, Trustee,
v.
THE CITY OF COLUMBUS.

Bill.

THE CITY OF COLUMBUS
v.
MERCANTILE TRUST & DEPOSIT CO. OF BALTIMORE, Trustee.

To the Honorable the Judges of said Court:

Your petitioner, the City of Columbus, defendant and cross-complainant in the above entitled cause, conceiving itself aggrieved by the final decree of this court rendered on the 3rd day of June, 1908, does hereby appeal from said decree to the Supreme Court of the United States, for the reasons specified in the assignment of errors, which is filed herewith.

Wherefore, your petitioner prays that this appeal may be allowed, and that a transcript of the record, proceeding and papers, from which said decree was made, duly authenticated, may be sent to the Supreme Court of the United States.

W. A. WIMBISH,
T. T. MILLER,
Solicitors and of Counsel for Petitioner.

Filed in clerk's office 20 day of June, 1908.

O. C. FULLER, *Clerk.*

414 *Order Granting Appeal.*

In the Circuit Court of the United States for the Northern District of Georgia, Western Division.

No. 59. In Equity.

MERCANTILE TRUST & DEPOSIT CO. OF BALTIMORE, Trustee,
v.
THE CITY OF COLUMBUS.

Bill.

THE CITY OF COLUMBUS
v.
MERCANTILE TRUST & DEPOSIT CO. OF BALTIMORE, Trustee.

Cross Bill.

The above-named defendant and cross-complainant in the above entitled cause, having prayed an appeal rendered by this court in the above entitled cause on the 3rd day of June, 1908, to the Supreme Court of the United States, and the said defendant and cross-complainant having filed with the clerk of this court its petition for appeal, together with an assignment of errors and an appeal bond, which bond has been duly approved by the court:

It is ordered, adjudged and decreed by the court that this appeal be granted and allowed, and that a transcript of the record, proceedings and papers, from which said decree was made, duly authenticated, be sent to the Supreme Court of the United States.

Dated and signed this 13th day of June, 1908.

WM. T. NEWMAN,
U. S. Judge.

Filed in clerk's office 20 day of June, 1908.
O. C. FULLER, *Clerk.*

415 *Assignment of Errors.*

In the Circuit Court of the United States for the Northern District of Georgia, Western Division.

No. 59. In Equity.

MERCANTILE TRUST & DEPOSIT CO. OF BALTIMORE, Trustee,
v.
THE CITY OF COLUMBUS.

Bill.

THE CITY OF COLUMBUS
v.
MERCANTILE TRUST & DEPOSIT CO. OF BALTIMORE, Trustee.

Cross Bill.

And now on this the 13th day of June in the year of our Lord 1908, in the City of Atlanta, State of Georgia, came the City of Columbus, defendant and cross-complainant in the above entitled cause, by its solicitors T. T. Miller and W. A. Wimbish, and say that in the decree rendered by the said Circuit Court of the United States for the Northern District of Georgia, Western Division, in the above entitled cause on the 3rd day of June, 1908, and in the record and proceedings in said cause in said court, there is manifest error as set out in this its assignment of errors which is filed simultaneously with its petition for appeal, because:

First. The Circuit Court erred in over-ruling the demurrer to the original bill of complaint in the above entitled cause.

Second. The Circuit Court erred in not dismissing said original bill of complaint, because the complainant has no such interest in the subject-matter as entitles it to maintain its suit, for that there is no privity of contract between the complainant and the defend-
416 ants named, or either of them, nor are any facts alleged upon which an independent suit at the instance of the defendant can be predicated.

Third. The Circuit Court erred in not dismissing said original bill of complaint, because there is a want of proper parties, for that The Columbus Water Works Company and W. S. Greene, as receiver thereof, are indispensable parties complainant.

Fourth. The Circuit Court erred in not dismissing said original bill of complaint, because there is a mis-joinder of parties defendant in this, towit: The Columbus Water Works Company is not a proper party defendant, for that its interest in the controversy is wholly that of a complainant.

Fifth. The Circuit Court erred in not dismissing said original bill of complaint for want of equity, because:

(1) There is no obligation resting upon The City of Columbus,

either contractual or otherwise, binding it not to erect its own system of waterworks.

(2) It is not alleged that The City of Columbus had revoked the franchise granted to The Columbus Water Works Company, or attempted so to do.

(3) The City of Columbus as a municipal corporation of the State of Georgia could not legally grant any exclusive franchise for the use of its streets to The Columbus Water Works Company, and any attempt so to do on the part of its mayor and council is void and in contravention of the Constitution and laws of Georgia.

(4) The Columbus Water Works Company being insolvent and all of its property, rights and assets having been placed in the hands of a receiver under the order of said Circuit Court, The Columbus Water Works Company is unable, and has been deprived of its power, to comply with its obligation under its contract with the City of Columbus.

417 Sixth. The Circuit Court erred in overruling the demurrer to the amended bill of complaint in the above entitled cause, because:

(1) The bill as amended is without equity;

(2) The said amendment is not germane to the cause of action set forth in the original bill and is in effect an application to the court to be allowed to pledge income and issue receiver's certificates for the purpose of enabling the receiver to relieve the default and to carry out the obligations of the contract. The amendment shows that the Columbus Water Works Company had failed to comply with the obligations of its contract to furnish the City and its inhabitants with a wholesome, constant and adequate supply of water for domestic use and fire protection.

Seventh. The Circuit Court erred in not dismissing the bill of complaint, as amended, because it appears from the ordinance of the City of Columbus providing for an election to determine whether the City could issue bonds for the purpose of constructing its own system of waterworks, a copy of which ordinance is attached to said original bill, that in abrogating its contract with said Water Works Company and providing for the construction of its own system, the City acted in the exercise of its police power and in due execution of the municipal trust committed to it.

Eighth. The Circuit Court erred in not sustaining the exceptions to the master's report filed in behalf of the City of Columbus.

Ninth. The Circuit Court erred in not sustaining the exceptions to that part of the master's report finding the value of that portion of the existing waterworks system which in the master's opinion could be made available by the City in connection with its proposed system, because:

418 (1) Whether any portion of the system of the Columbus Water Works Company could be made available to the City in the construction of its proposed system, and the value of such portion, were not issues raised by the pleadings and are irrelevant to a correct determination of the cause;

(2) No evidence was adduced by either party with respect to such questions, the same not being in issue, nor were these questions, or either of them, discussed by counsel in the argument.

(3) There is no evidence in the record to sustain the said findings of the master.

Tenth. The Circuit Court erred in holding and deciding that the contract between The City of Columbus and the Columbus Water Works Company, as assignee of Thomas F. White, did not create a debt in contravention of the Constitution and laws of the State of Georgia, because the question of incurring such indebtedness was not submitted to a vote of the people as required by the Constitution of the State.

Eleventh. The Circuit Court erred in holding and deciding that the contract in question conferred upon the Water Works Company an exclusive franchise or privilege of furnishing the City and its inhabitants with water for a term of years not yet expired; whereas, the contract should have been so construed as conferring an exclusive privilege of supplying water to the City and its inhabitants from the source selected and by means of the system constructed, leaving the City free to adopt any other source of supply and such other means of distribution as should not infringe upon such special privilege.

Twelfth. The Circuit Court erred in holding and deciding that under the Constitution and laws of the State of Georgia, the City of Columbus had power and authority to make a contract granting an exclusive franchise or privilege for a term of years; whereas the granting of such exclusive franchise or special privilege is forbidden to the City by the Constitution and laws of the State.

419 Thirteenth. The Circuit Court erred in holding and deciding that under "the general welfare clause" of the City's charter it was authorized to enter into a contract granting an exclusive privilege for a term of years; whereas the City was without any express authority to make such contract or to grant such exclusive privilege, and under the Constitution and laws of the State no such authority could have been given to the City by the General Assembly.

Fourteenth. The Circuit Court erred in holding and deciding that the right of the City to make an exclusive contract for the supplying of water to the City and its inhabitants was a necessary and indispensable incident to its right to exercise the police power under the general welfare clause of its charter; because the grant of an exclusive franchise for a term of years is not an indispensable incident to a contract for a water supply in the exercise of the inherent power of the City to provide for the health and comfort of its citizens and for the protection of property against fire.

Fifteenth. The Circuit Court erred in failing and refusing to hold that the contract in question, in so far as it may have granted an irrevocable special privilege or exclusive franchise, if any, contravened the provision of the Georgia Constitution forbidding the making of irrevocable grants of special privileges or immunities.

Sixteenth. The Circuit Court erred in holding and deciding that a revocation of the contract in question would offend that provision of the Georgia Constitution declaring that no grant of special privileges or immunities shall be revoked except in such manner as will work no injustice to the corporators or creditors of the corporation; because the ordinance of the City providing for the construction of its own municipal system, and the acts done in pursuance thereof, in no wise interfered with the physical tangible property of said Water Works Company, or of its right to continue to operate its
420 own system, and for that purpose to use the streets of the City, but only affected the exclusive right claimed under the contract to furnish the City and its inhabitants with water.

Seventeenth. The Circuit Court erred in holding and deciding that this case comes within and is controlled by the decision of the Supreme Court in the case of Vicksburg *vs.* Vicksburg Water Works Company, 202 U. S. 453; and the Court erred in holding that there is no material difference between the local law in Mississippi and the local law in Georgia at the time the contract in question was entered into; whereas there is a material and decided difference in said local laws. The provision in the Constitution of the State of Mississippi, relied upon in the Vicksburg case, was adopted after the contract there involved had been entered into, while in this case the Constitutional provisions referred to preceded and were in force at the time of the execution of the contract in question; and also because at the time the contract was entered into the Constitution and laws of the State of Mississippi, as construed by the Supreme Court of the State, authorized the granting of exclusive privileges, while the Constitution and laws of the State of Georgia forbid such irrevocable grants.

Eighteenth. The Circuit Court erred in failing and declining to hold that The City of Columbus was justified in the exercise of its police power in seeking another source of water supply and in undertaking to construct a municipal system of waterworks, under the circumstances and conditions as they existed at the time, without thereby incurring any obligation to The Columbus Water Works Company, or to the holders of its bonds; because the master found that the Water Works Company had failed and was unable to comply with the requirements of the contract for supplying the City with an adequate quantity of wholesome water; and the Circuit Court declared that the facts in evidence were sufficient to justify
421 the master in finding that there was a failure on the part of the Water Works Company to furnish an abundant supply of pure and wholesome water as provided in the contract, and finding the company at fault in this respect.

Nineteenth. The Circuit Court erred in holding and deciding that notwithstanding the default and inability of the said Water Works Company to comply with the requirements of the contract, the City of Columbus should be restricted in the exercise of its police power by assuming the obligation to purchase the whole or some part of the system of the Columbus Water Works Company; whereas the City

should not be hampered in discharging its high municipal trust by the proper exercise of its police power.

Twentieth. The Circuit Court erred in declining to grant the relief prayed under the cross-bill; because the said Water Works Company had failed and was confessedly unable to comply with the requirements of the contract to furnish the City and its inhabitants with an abundant, wholesome and continuous supply of water for domestic and sanitary uses and for fire protection.

Twenty-first. The Circuit Court erred in declining to grant the City an unconditional decree in its favor, under its cross bill, rescinding and setting aside the contract in question because of the admitted defaults of the Water Works Company and its recognized inability to comply with the requirements.

Twenty-second. The Circuit Court erred in requiring the City as a condition of a decree in its favor to purchase the whole or any part of the system of the Columbus Water Works Company upon a valuation to be arrived at by arbitration or to be otherwise ascertained by the Court; because:

(1) The question whether the City should be required to purchase any part of the water works system is not raised by the pleadings, is not in issue, and was not discussed by counsel, and is irrelevant to a correct determination of the controversy.

(2) The Circuit Court is without authority to make the
422 decree conditional, for that under the law, and under the facts as found by the master and approved by the court, the City is entitled to an unconditional decree in its favor as a matter of right and not of grace.

(3) The City being entitled as of right to a decree in its favor the requirement that it shall purchase any part of the Water Works system at any price violates the liberty of private contract and is beyond the province of the judiciary.

Twenty-third. The Circuit Court erred in holding and deciding that the holders of the bonds of the said Water Works Company, represented by the complainant as trustee, had become vested with a right of equity as against the City superior to the right and equity of the Water Company with regard to the contract in question; whereas there being no privity of contract between the said bondholders and The City of Columbus, and the master having found that said bondholders had purchased their bonds with full notice of the contract, the rights and equities of the bondholders as against the City are no higher than those of the Columbus Water Works Company.

Twenty-fourth. The Circuit Court erred in holding and deciding that because the bondholders consented to the issuance of receiver's certificates as a first charge on the property and incomes of the Water Works system for the purpose of enabling the receiver to so improve the system as to be able to meet the requirements of the contract, thereby substantially improving the service, and because the City of Columbus and its inhabitants have since taken and paid for water, the bondholders have acquired an equity superior to the legal right of the City to have the contract rescinded because of the

defaults of said Water Works Company; whereas the City's hands being tied under the orders of the Court it was under the imperious necessity of using the only available water supply, for which it was in good conscience bound to pay, and the bondholders have not acquired any superior equity by reason of the facts alleged.

423 Twenty-fifth. The Circuit Court erred in holding that the maxim: "He who seeks equity must do equity" is applicable to this case, because the maxim is only applied in those cases in which the party invoking it is vested with a superior equity, and in those cases in which the relief prayed is discretionary; whereas the maxim can have no application to a party standing upon his legal rights and asking no favors of the court.

Twenty-sixth. The Circuit Court erred in holding and deciding that the option given the City by the contract in question of purchasing the water works system at stated periods, upon a valuation to be arrived at by arbitration, adds to the duty of the City to take the waterworks plant at a fair valuation; and the court erred in holding that such option adds something to the equities of the bondholders; because a mere option imposing no obligation unless exercised cannot be made to limit the legal rights of the City nor to create equities in favor of third persons.

Twenty-seventh. The Circuit Court erred in ordering and decreeing that the contract in question between Thomas R. White and the Mayor and Council of Columbus was a valid and binding contract.

Twenty-eighth. The Circuit Court erred in ordering and decreeing that the City of Columbus had authority to make the contract in question; that the contract did not create a debt in violation of the Constitution of the State of Georgia and was not invalid by reason of its exclusive feature, or for any other reason.

Twenty-ninth. The Circuit Court erred in ordering and decreeing that the contract in question granted an exclusive privilege, and that the City of Columbus was thereby precluded from entering into competition with the Water Works Company by erecting, maintaining and operating a system of its own during the continuance of the contract.

424 Thirtieth. The Circuit Court erred in ordering and decreeing that the complainant, Mercantile Trust & Deposit Company as trustee, is entitled to the rights, benefits and provisions of the contract in question.

Thirty-first. The Circuit Court erred in ordering and decreeing that the City of Columbus should be required to purchase the Water Works plant, or so much thereof as may be thereafter ascertained, at a valuation to be arrived at by arbitration, or by experts appointed by the court, as a condition of the City's right to establish a municipal water works system of its own.

Thirty-second. The Circuit Court erred in ordering and decreeing that unless and until the City of Columbus should purchase the existing waterworks system, or some part thereof, the City, its officers, servants and agents, should be enjoined from taking further action towards the issuance or sale of bonds for the purpose of establishing

said waterworks by said City, and from erecting, maintaining, or operating said waterworks, or from supplying water for fire protection, or other municipal purpose, or laying or permitting the laying of mains, or other waterworks, or water pipes, or for the construction of waterworks, in violation of the contract in question.

Thirty-third. The court erred in ordering and decreeing the costs of the suit against the defendant.

Wherefore, the City of Columbus, the above named defendant and cross-complainant, prays that the said decree of said Circuit Court of the United States for the Northern District of Georgia, Western Division, rendered in the above entitled cause on the — day of June, 1908, be reversed, and that said Circuit Court be ordered to enter a decree dismissing said original and amended bills filed in said above entitled cause in said court by complainant, Mercantile Trust & Deposit Company of Baltimore, as trustee, and to
425 enter an unconditional decree in favor of The City of Columbus under and in accordance with the prayers contained in its said cross-bill.

W. A. WIMBISH,
T. T. MILLER,
Solicitors and of Counsel for The City of Columbus, Appellant.

Filed in Clerk's office 20 day of June, 1908.
O. C. FULLER, *Clerk.*

426 *Appeal Bond.*

In the Circuit Court of the United States for the Northern District of Georgia, Western Division.

No. 59. In Equity.

MERCANTILE TRUST & DEPOSIT CO. OF BALTIMORE, Trustee,
v.
THE CITY OF COLUMBUS.

Bill.

THE CITY OF COLUMBUS
v.
MERCANTILE TRUST & DEPOSIT CO. OF BALTIMORE, Trustee.

Cross Bill.

Know all men by these presents: That we, The City of Columbus, as principal, and The Title Guaranty & Surety Co., as surety, are held and firmly bound unto the above named Mercantile Trust & Deposit Company of Baltimore, Trustee, for the payment of which well and truly to be made the above named obligors, and each of them, their successors, heirs, executors and administrators, are jointly

and severally bound, firmly by these presents. Sealed with our seals and dated this the 12th day of June, in the year of our Lord 1908.

Whereas, the above named The City of Columbus has prosecuted an appeal to the Supreme Court of the United States to reverse the decree rendered on the 3rd day of June, 1908, in the above entitled cause by the Circuit Court of the United States for the Northern District of Georgia, Western Division,

Now therefore, The condition of the obligation is such that if the above named, The City of Columbus, shall prosecute said appeal to effect and answer all damages and costs if it fails to make good
427 said appeal, then this obligation to be void; otherwise to remain in full force and effect.

THE CITY OF COLUMBUS, [L. S.]
By T. T. MILLER AND W. A. WIMBISH,
Its Counselors and Attorneys in Fact.

[Seal The Title Guaranty & Surety Co.]

THE TITLE GUARANTY & SURETY CO.
By H. H. HUNTER, *Agent.*
W. G. LOVE, *Att'y in Fact.*

In the presence of:

ED. WOHLWENDER.
[SEAL N. P.] *Notary Public, Muscogee County, Ga.*

Bond approved and accepted, this 20th day of June, 1908.
WM. T. NEWMAN,
U. S. Judge.

Filed in clerk's office 20th day of June, 1908.
O. C. FULLER, *Clerk.*

428 *Citation.*

UNITED STATES OF AMERICA, *ss:*

The President of the United States to Mercantile Trust & Deposit Company of Baltimore, Trustee, and The Columbus Water Works Company and W. S. Greene as Receiver thereof—Greeting:

You are hereby cited and admonished to be and appear at the Supreme Court of the United States, at the City of Washington, within thirty days from the date of this writ, pursuant to an appeal duly allowed by the Circuit Court of the United States for the Northern District of Georgia and filed in the office of said court on the 13th day of June, 1908, in a cause wherein The City of Columbus is appellant and you are appellees, to show cause, if any, why the decree rendered against the said appellant as in said appeal mentioned should not be corrected and speedy justice should not be done to the parties in that behalf.

Witness the Honorable Melville W. Fuller, Chief Justice of the United States, this the 13th day of June in the year of our Lord 1908.

WM. T. NEWMAN,
U. S. Judge.

Filed in clerk's office 20 day of June, 1908.

O. C. FULLER, *Clerk.*

Acknowledgment of Service.

Due and legal service of the foregoing citation and appeal is hereby accepted and acknowledged, and all other and further service and notice is hereby waived. This 24th day of June, 1908.

JOS. PACKARD,
OLIN J. WIMBERLY,
Solicitors and Counsel for Mercantile Trust & Deposit Company of Baltimore, Trustee.
COLUMBUS WATER WORKS CO.,
By FRANK U. GARRARD, *Secy.*
W. S. GREENE, *Receiver.*

Returned and filed in Clerk's office 2d day of July, 1908.

O. C. FULLER, *Clerk.*
By N. A. BROWN, *Deputy Clerk.*

429 UNITED STATES OF AMERICA,
Northern District of Georgia, Western Division, ss:

I, Olin C. Fuller, clerk of the United States Circuit Court in and for the Northern District of Georgia, in the Fifth Judicial Circuit, do hereby certify that the foregoing pages, numbered from 1 to 546, inclusive, in Volume numbered 1; and from 1 to 428 inclusive, in Supplement 1 to Volume numbered 1; and from 1 to 1295, inclusive, in Volumes numbered 2, 3 and 4; contain a true, full, correct and complete transcript of the record and proceedings had in said Court in the causes wherein the Mercantile Trust and Deposit Company of Baltimore, Trustee, is complainant, and The City of Columbus, is respondent; and The City of Columbus, is cross-complainant, and Mercantile Trust and Deposit Company of Baltimore, Trustee, is respondent; as the same appear of record and now remain of file in my office at Columbus.

In testimony whereof, I have hereunto set my hand, and caused the seal of the said Court to be affixed, at the City of Columbus, in the Northern District of Georgia, Western Division, in the Fifth Judicial Circuit, this 20 day of July, in the year of our Lord one thousand nine hundred and eight.

[Seal U. S. Circuit Court, West'n Div. N. D. Georgia.]

OLIN C. FULLER, *Clerk.*

4:30 In the Circuit Court of the United States for the Northern District of Georgia, Western Division.

No. 59. In Equity.

MERCANTILE TRUST & DEPOSIT CO. OF BALTIMORE, Trustee,
vs.
THE CITY OF COLUMBUS.

Bill.

THE CITY OF COLUMBUS
vs.
MERCANTILE TRUST & DEPOSIT CO. OF BALTIMORE, Trustee.

Cross Bill.

Order Extending Time for Making Transcript.

An appeal to the Supreme Court having been allowed in the above entitled cause on June 13th, 1908:

And it being made to appear that the Clerk of the Court cannot prepare and transmit to the Supreme Court a transcript of the record within the thirty days allowed from the date of the granting of said appeal:

It is thereupon ordered that the time for transcribing and transmitting the record on appeal in said above entitled cause be and the same is hereby extended until September 1st, 1908.

Dated and signed this 27 day of June, 1908.

WM. T. NEWMAN,
U. S. Judge.

[Endorsed:] No. 59. Mercantile Trust & Deposit Co. *vs.* City of Columbus *et al.* Order Extending time for Clerk to make final record to Sept. 1, 1908. Filed in Clerk's Office June 27, 1908. O. C. Fuller, Cl'k. By N. A. Brown, Deputy.

1 W. S. GREENE, sworn by the complainant, testified as follows:

(By Mr. WIMBERLY:)

Q. You are the Receiver of the Columbus Water Works Company?

A. Yes, sir.

Q. Appointed by Judge Newman?

A. Appointed by Judge Newman last January.

Q. Acting as United States Circuit Court?

A. Yes, sir.

Q. You mean January of last year?

A. January of '03.

Q. As such receiver are you in charge of the water works plant and property of the Columbus Water Works Company?

A. Yes, sir. I am more in charge of it by virtually acting as General Manager. It is outside of the scope of the duties of a receiver.

Q. You have the general management of it, have you?

A. Yes, sir.

Q. I will ask you: Since your appointment, what if anything, you have done, looking to the improvement of the water works company's system here?

A. After looking over the situation in January, trying to purchase land to establish a plant or filter plant. I did purchase land the first of March and got possession of the property and then went to work erecting a filter plant on that property, located on 17th Street—at the foot of 17th street, adjoining the river; and on the 18th day of April started my pumps to w-*k*ring drawing water from the reservoirs to force into the city mains and to force into the standpipes.

2 Q. What was the cost of that filter plant?

A. That filter plant cost in the neighborhood of $34,000. —$33,900 and something.

Q. You are by profession a civil engineer?

A. Yes, sir.

Q. I will get you to state as to the character of that filter plant—I mean by that as to whether it is the most approved style, etc.?

A. In the first place: it is well located. In the second place it is well constructed; and in the third instance it is doing its duty admirably and well. We can filter two million gallons per day, provided the city requires or uses that much. We only filter about a million gallons per day. The greatest amount the city has used in any one day was 1,169,000 gallons.

Q. Have you at all the times, since you have been Receiver, had on hand all the water the city required?

A. Since I have been here, yes. I found plenty of water in January, when I came here and there has been plenty of water since, in fact, more water than we can use. We have to shut down our valves every night to keep the water from overflowing our settling basins—

have no use for it, can't use it, after filling our standpipes; and we have to close up our supply pipes to keep the water from coming in.

Q. How does the present capacity of the present plant compare with the needs of the city?

A. We can give them double what they need at present. We can give them two million gallons and they only need about a million. The average for the month of December was 925,739 gallons. That's all that was used in December. That is taken from the daily
3 record that is kept.

Q. You mean December, 1903?

A. 1903, yes, sir. The way we get at that is, no water is furnished to the city except what passes through the pumps. In the first place it has to pass through the settling basins into the standpipes, or going to the mains direct. Always pumped now into the standpipes; and each pump has what is called a counter on it which gives the number of strokes of the piston. Each chamber holds 16 gallons, or 16 gallons every stroke; and each chamber has to be thoroughly filled with water or there will be a vacuum and the pump will stop counting. Every stroke is counted automatically; and multiply the number of strokes by 16 gallons gives us the number of gallons pumped each day. That's the way we get at the number of gallons pumped each day. In washing out the filters, that amount of water is deducted from the total amount in the filters. We usually wash out some 4 or 5 times a day.

Q. You say that is deducted?

A. Yes. That passes back into the river.

Q. After deducting that, the balance gives the amount that passes into the system?

A. What goes into the city's mains, yes.

Q. What has been the pressure during the time that you have been acquainted with the works—in charge of it here?

A. They say the pressure, up to the time I started the pumps, was only about 20 to 22 pounds. On the 18th of April when I got my pumps to working—I referred to Mr. Colsen's letters in my file—in my letter book to tell the time I started the pumps;
4 and in two hours afterwards the pressure rose to 42 pounds; and never has been under that since.

Q. Just, of course without being strictly accurate, in order to get it clear in the record, 42 pounds is equivalent to about how many feet of pressure?

A. 84 feet. 42 pounds pressure is equal to about 84 feet in height.

Q. That's what I mean?

A. Every two feet in height represents a foot of pressure, and a little fraction over.

Q. Before you got your pumps working, you spoke of the pressure being less, when did you start to work putting in your pumps and other changes?

A. The first of March. As soon as I bought the land I immediately removed the house on it and began work—began work on the 2nd day of March.

Q. Are they entirely independent of the two last mentioned sources?
A. Yes, sir.
Q. Then that $95,000——
Mr. MARTIN (Interrupting): He has not given any sum.
Q. What is the total amount?
A. I don't know the odd dollars but it was $95,000, and some hundred dollars. I don't recollect it. I could take the books and show it to you.
Q. Let me have that affidavit?
A. I know it was $95,000 and something.
Mr. GARRARD: Have you any objection to my naming the amount?
Mr. WIMBISH: No, I think your questions are leading anyhow.
Q. Say $95,904.53 is the correct amount?
A. Yes, that's correct to the best of my knowledge and belief.
Q. Do those amounts constitute the betterments and improvements of the water plant?
A. Yes, sir.
Q. How are those improvements made, made by contract or done by the company?
A. Done by the company.
Q. Were they done economically?
A. Yes, sir.
Q. What prices did you pay for labor?
A. Seventy-five cents a day for common labor.
Q. How much extra labor did you hire in addition to that?
A. Had only one man, that is the caulker, who caulks the pipe together.
Q. How many thousand feet of pi-e were purchased for the Rose Hill connection?
65 A. That was bought before I went in the office.
Q. It was there?
A. It was there in the ground.
Q. Wasn't it really on top of the ground but laid afterwards?
A. No, sir.
Q. Was the Rose Hill Standpipe?
A. Built before I went in the office, yes, sir.
Q. Do you know what that pipe cost?
A. $17.90 a ton. I looked up the invoices.
Q. Did you look up the amount of pipe—the thousand feet of pipe?
A. No, sir; I don't think I did.
Q. Wasn't it about 30,000 feet of pipe?

Objected to as leading.

WITNESS: Yes, so I heard.
The MASTER: That is hardly within the rule, Mr. Garrard.

Q. About how many, to the best of your recollection, about how many thousand feet?
A. About 30,000 feet.

Q. Well, is pipe much higher or lower than it was at that time?
A. Good deal higher. The last pipe we bought we paid $33.20 a ton.
Q. $33.20?
A. Yes, sir.
Q. So that amount of pipe would cost a much larger sum of money—would make the sum of $95,000 much greater?
A. Yes, sir.
Q. At the present time?
A. Yes, sir.
Q. What would labor cost at the present prices?
A. A dollar a day, I think—I know it is a dollar a day they pay for common labor now.
Q. Hasn't lead—has lead advanced?
66 A. I really don't know, sir, whether it has advanced or not. Would not be a very large item.
Q. What would you say would be a reasonable amount of money at the present prices and the present values for the values that were received by the company for which they paid $95,904.53, I mean with the increase added on?
A. I don't know as I could say without making some calculations on it.
Q. Would it be more or less than one hundred thousand?
A. I am satisfied it would be more.
Q. Would it be as much as $125,000?
A. No, sir; I don't hardly think it would be.
Q. Mr. Epping, do you re-call the time that the books of the company showed that the City of Columbus commenced paying to the Columbus Water Works Company $2000. for the extension on Rose Hill?
A. Yes, sir.
Q. What was the date?
A. First of July, 1900.
Q. Did they continue to pay that from that time on?
A. Yes, with one exception.
Q. That's when they stopped that quarterly payment—that was this last year?
A. Year before.
Q. Well what I want to ask you is, was everything done that was required by the special committee of the water works company?

Objected to as leading and would be a conclusion on the part of the witness.

The MASTER: You can show what was required and what was done. That would be proper.

67 Q. What was done by the water works company to comply with the matters required to be done by the council and special committee on water works towards the end of it and just before the $2000. was commenced to be paid by the city?
A. They laid the 30,000 feet of pipe on Rose Hill and placed hydrants on those pipes wherever designated by the city authorities. Then the chief of the fire department and I think the chairman o

the water works company and a committee of council they were to say where these fire plugs were to be placed. That's all I know was required.

Q. Did they announce whether or not they were satisfied with what was done?

A. By the payment of the bill I expect they did.

Objected to.

Q. What did they say, did they pay the bill?

A. Yes, sir.

Q. In accordance with the resolution of council?

A. Yes, sir.

Q. Did they continue to do that?

A. Yes, with that one exception that I made just now.

Q. Which one of the exceptions do you refer to?

A. Year before last.

Q. In the summer time?

A. Yes, when the water was river water pumped into the mains.

Q. You speak of when the river water was pumped into the mains. How long was the city without water after that break of the 14th Street bridge, how many hours?

A. How many hours?

Q. Yes?

A. The bridge washed away at five o'clock in the afternoon
68 and the next morning at nine o'clock, I think it was.

Q. When was the submerged main turned on?

A. That was turned on right away. As soon as they could possibly get to it to turn it on.

Q. When did they discover that the standpipe had emptied itself?

A. Sometime in the morning.

Q. The next morning?

A. Yes, sir.

Q. How long was the connection from the river turned on?

A. As soon as Mr. Preer could 'phone Mr. Chappell and get his consent. About nine o'clock, I think, the next morning.

Q. There was about how many hours, 2 or 3, or 4 or 5?

A. I don't know what time they discovered that the standpipe was empty. Sometime in the early morning. When we got to the office the next morning and found they did not have any water, went right out to find Mr. Chappell; and when he found him I think it was about nine o'clock and he consented for the water to be turned on from the river—pumped out from the river.

Q. How was that valve at the power house connected with the river—I mean the pump at the power house?

A. By a suction pipe. Two suctions. One from the reservoir and the other right down on the river.

Q. You mean by that that the suction from the reservoir was by a straight main?

A. Yes, sir.

Q. Brought up First Avenue?

A. Yes, sir.

Q. How was it connected with the pump?

A. There were two lines that went across the bridge. Two
69 lines of six inch pipe connected with the eight inch pipe that went up First Avenue down to the power house.

Q. In point of fact those lines divided at the bridge?

A. Yes, sir.

Q. And connected together on the other side?

A. Yes, that was done by request of the railroad company to equalize the weight on the bridge.

Q. They placed two six inch pipes on the bridge?

A. Yes, sir.

The MASTER: Don't lead him.

Q. What did they do?

A. What did they do? Connected it to the pump.

Q. Now do you know what the size of that pipe was that connected with the pump?

A. Eight inches.

Q. That connected with the pump; so that when the pump was in action, what did it pump out of?

A. Pumped out of a main.

Q. You mean the main that——

A. From the reservoir.

Q. Now this suction you say was put in by request after the bridge broke—connected with the river?

A. Yes, sir.

Q. How long had that suction been in there?

A. I don't know. Been in there sometime.

Q. Why was that suction placed there?

A. In case of an emergency, anything were to happen they could get water from the river.

Q. Was it or not intended to guard against such a contingency as this?

A. Yes, sir.

Q. Why was Mr. Chappell's consent asked to use that connection with the river—why was it necessary?

70 A. I don't recollect exactly. I think they discussed it in the office and decided that it would be best to get his consent to do it.

Q. Has the city ever been without water except for the few hours the year that the bridge broke, that you recall?

A. No, sir; I don't think so. I don't recollect it since I have been with the office, except at that particular time.

Q. What was done in addition to bringing in the use of these pumps at the power house, what other arrangement was made for furnishing water to protect the city from loss by fire?

A. We laid a 12 inch pipe from the 12 inch main on the other side of the river up to the railroad and crossed the railroad bridge and connected it in with the main on First Avenue that carried the water from the reservoir down to the Broad Street standpipe.

Q. All of the main was of what character of iron except the part which went on the bridge?

A. Cast iron pipe.

Q. What was the part that went on the bridge made of?
A. Wrought pipe.
Q. That ordinary wrought pipe?
A. Standard weight pipe, what was ordered.
Q. Why was that used on the bridge?
A. On account of the vibration. The joints, when screwed together, are flexible and the other is not.
Q. Do you re-call the direction that was taken by this line up here where it started in Pheuix City, running North?
Q. It run Northwest, didn't it, to the railroad?
Q. Then east?
A. To the bridge—to the cast iron pipe.
71 Q. Then did it rise up to the bridge and make another bend?
A. Yes, a little bit to get it out of the ground.
Q. That made another angle?
A. Yes.
Q. That made three angles on the Alabama side?
A. Yes, sir.
Q. One when it left the old water works main?
A. Yes, sir.
Q. The other where it turned to the right on the railroad?
A. Yes, sir.
Q. The third where it turned up?
A. Yes, sir.
Q. Didn't it have to make still another angle when it started across the bridge?
A. I think that's what they called a one eighth, used on both sides of the bridge.
Q. That made four bends in the pipe on the Alabama side instead of three?
A. Yes.
Q. When it got on the Georgia side what was the first bend?
A. The same as on the Alabama side. Two one eighth bends used to connect with the cast iron pipe on this side, so as to get it down in the ground to cover it up.
Q. From that point there were how many more bends before it struck the main to get it back to the standpipe on the Georgia side?
A. Yes, it connected there on First Avenue.
Q. That was another right angle?
A. Yes.
Q. Then it came South?
A. To 14th Street.
Q. That was another right angle?
A. Yes, ⅛th bend they used instead of a ¼th elbows which made it a little easier.
Q. That would make eight angles?
A. Yes, sir.
Q. Then it made another angle?
A. In Broad Street.

72 Q. Making about nine different angles or turns to bring that water back to Broad Street by this temporary arrangement across the railroad bridge?

A. Yes, sir.

Q. How was that pipe laid, laid with lead?

A. Yes, sir; cast iron pipe laid with lead joints.

Q. How was the pipe laid on the bridge?

A. Screwed together.

Q. What finally became of that pipe after the 14th Street bridge was re-built, the new steel bridge, where was the wrought pipe re-laid?

A. On the 14th Street bridge.

Q. Is it there now?

A. Yes, sir.

Q. The remainder of the pipe that was laid in Phenix City the 12 inch cast iron pipe?

A. That was taken up, since Major Greene has been here and laid on 14th Street and up First Avenue as a supply pipe to the filter plant from the reservoir.

Q. All of that pipe is in use now?

A. Yes, sir.

Q. How about the lead joints have they been re-used?

A. Yes, sir.

Q. So in point of fact there was nothing wasted out of that material?

A. Very little.

The MASTER: I want to ask one question there: The witness testified when he first began as to the amount of these improvements, in round numbers, $95,000. In asking the question you put it up to a certain date, in '03 or '02, which was it?

WITNESS: 1902.

The MASTER: You didn't ask him, I observed, the date back of that: covering what dates was this amount paid: In other words you named the last date only?

73 (By Mr. GARRARD:)

Q. About from what date, when the new company took charge?

A. I think it was in February, 1891.

Q. It was between those two dates, from February '91 up to July 1902 that that $95,904.53 was expended?

A. As betterments, yes.

Q. You keep books also for the Receiver?

A. Yes, sir.

Q. Does that amount or not include any of the amounts expended since the receiver has been in charge?

A. No, sir. That was made up to July, 1902.

Q. From that time up to the present time is the amount testified to by Major Greene?

A. Yes, sir.

Q. Was there any other arrangement that could have been made

to bring that water from the Alabama reservoir across to the Georgia side other than that which was adopted by the company, on the railroad bridge?

A. No, sir; I don't think it could.

Q. Now what length of time was consumed in getting these pipes across from the Alabama side to the Georgia side and re-establishing water connections with the reservoir?

A. I think it was early in April that the water was turned on from the reservoir again. Had to order the pipe and all had to come by freight.

Q. About what time did that break occur?

A. I think it was the last day in February, 1902.

Q. How soon was the pipe ordered?

A. Just as soon as it could be ordered, by telegraph.

Q. The cast iron pipe was ordered from what point?

A. From Birmingham.

Q. Where was the wrought iron pipe ordered from?

74 A. We ordered it through The Aurens & Scott Mfg. Co., Louisville and came to us from the National Tube Co., Pittsburg, Pa.

Q. Is that character of pipe kept on hand or is it made to order?

A. Kept on hand, yes. I think they carry *of* sizes.

Q. How long did it take that pipe to get to Columbus?

Mr. WIMBISH: I would like to ask the object of all this detailed examination at this point?

Mr. GARRARD: I want to show that the company was confronted at that time by a great emergency and that it met the emergency as well as money, means and effort could meet it.

The MASTER: I think that is admissible.

Mr. WIMBISH: We state in the answer that they promptly replaced that break.

The MASTER: You state that the break occurred in Feb'y and the connection was made on this railroad bridge in April: What year was that?

WITNESS: The following April, 1902.

Mr. GARRARD:

Q. How long was it before communication with the reservoir was restored?

The MASTER: Didn't he state that?

Mr. GARRARD: I don't think he has stated it.

The MASTER: Connection made in April and the break occurred in Feb'y.

WITNESS: About a month or a little over—a month, is my recollection.

Q. In addition to this connection with the reservoir, what other connection was made before that connection with the reser-

75 voir was restored in order to give to the city increased fire protection?

A. Made connection with the Eagle factory pump. Laid some eight inch pipe from Broad on 13th Street down to the Eagle Factory and had direct connection with their pumps.

Q. Was there any telephones established?

A. Yes, sir; had a telephone there and paid for it ourselves.

Q. Where?

A. At the Eagle Factory down in the pump room of the Eagle Factory.

Q. About how *amy* of those pumps were brought into requisition—about what available horse power, do you recall?

A. No, sir.

Q. You don't re-call?

A. No, sir.

Q. Was it so connected that the entire power of the Eagle Factory could be used?

A. Yes, sir.

Q. Steam or river?

A. Yes, sir; connected so we could use of all their water pumps.

Q. That connection still remains?

A. Yes, sir.

Q. In case of an emergency—a great emergency occurring by breaking of the mains, anything of that kind, if it was possible to happen, the available power of the Eagle & Phenix Mills could be used?

A. Yes, sir.

Q. What was the fire pressure during the year 1902, after they commenced to use the steam water pumps, after the disaster to the bridge?

A. I don't know, sir. Mr. Preer is more familiar with that part than I am. He looked after all that part of it.

Q. What amount of pressure were they able to give in
76 case of fire.

—. It varied. From the Rose Hill standpipe usually get about 65 to 70 pounds.

Q. No one has explained and if you know it I would like for you to explain how this up town system North of 14th Street was connected at the standpipe so as to make it available by the men and officers of the Columbus Fire Department at engine house No. 1?

A. There is a by-pass, a pipe around the Broad Street stand pipe that is connected with the main—with a valve on the main on Broad Street. When this water is turned in from the Rose Hill standpipe, the pressure being greater than the Broad Street standpipe, it closes a check valve and prevents the water from coming out of the Broad Street standpipe. When he opens that eight inch valve, Mr. McKerley, one of the engineers at the engine house, he has control of that valve; and having control of it, whenever they want that high pressure, they turn it in themselves. It is within the discretion of the fire department and by turning that valve it lets in the water from the Rose Hill standpipe. It is inside of No. one engine house.

Q. How long does it take to open that valve?

A. Less than a minute.

Q. Do you re-call the discussion that took place at the time that valve was put in as to whether they would attemp- to do it with a lever or with a screw valve and what was decided in order not to cause a water hammer by turning it on too suddenly?

A. No.

Q. If it was turned on with a lever it would rush down
77 with such force from Rose Hill that it might cause destruction.

Objected to by respondents on the ground that the testimony is argumentative and the witness says that he does not remember anything about it.

Mr. GARRARD: I am trying to re-call his recollection about it.

The MASTER: The question is not exactly in proper form. You can ask him what was done. If there was any other plan suggested what was finally decided on and whose suggestion, if that is the object of it.

Q. What sort of a valve connection is this?

A. It is what they call an indocator valve, shows when it is open and when it is closed by a little word "open" and "closed," is printed on something inside of the valve when it is open and when it is closed.

Q. Where is that valve placed?

A. It is in the rear of No. 1 engine house, right on the main.

Q. In an extension?

A. Yes, in a little extension that we built ourselves and paid for it to the engine house—in the rear of the engine house.

Q. State whether or not there is any contrivance enabling the city to use that water promptly so far as you know by the water works company?

A. Yes, sir.

Objected to.

Q. What did the company do?

The MASTER: That's a proper question.

Q. What did they do in order to make that connection with the Rose Hill standpipe available?

78 Mr. WIMBISH: I think the witness has testified to that.

A. They put in a wheel valve there.

Q. Do you re-call under whose suggestion and the circumstances under which this valve was put in?

A. No, sir, I do not, exactly. I know that it was under discussion and that was the valve they decided on as being the easiest to handle. Instead of having a key to put it down in place to turn the valve, this has a long stem with a wheel on it and it stands up above, nearly 3 or 4 feet—2½ or three.

Q. That stationary?

A. Yes, sir.

Q. With an ordinary key is that stationary?

A. No, sir, because the keys are kept in the office. This has a

stationary wheel valve so they can turn it in a minute. It is always there.

Q. Any of the city authorities consulted about this valve?

A. I think so. I don't know positively about that.

Q. Any objection made to using that?

A. No, sir; not that I know of.

Q. Any improvement suggested by anybody?

A. No, sir.

Q. If the water failed to respond at any time was it caused by opening the valve or not opening it, from Rose Hill, when the standpipe is full of water?

A. I don't understand your question exactly.

Q. I mean if the fire department turned that valve, what would be the natural result, would the water from the Rose Hill standpipe flow into the mains down town?

A. Yes, sir.

Q. And continue to flow until that valve was closed?

A. Yes, sir; as long as there was water in the standpipe.

79 Q. Any electrical connection made between any fire company to give notice that there was a fire or so they could notify the power house that there was a fire and that they wanted the pumps started?

A. Yes, sir; the same alarm of fire, when the fire alarm bell here rings it would ring at the power house.

Q. Was there any electrical connection made with the standpipe on Rose Hill by means of a float or valves or otherwise by which they could be communicated automatically to the power house?

A. Yes, sir. To show how much water it had or whether it was running over or not.

Q. So that at any time they could ascertain——

A. By gauges.

Q. The amount of water in the standpipe?

A. Yes, sir.

Q. Explain to the court what is meant by a "still-alarm"?

A. It is a telephone message, I think.

Q. Are the fire bells rung when a still alarm occurs?

A. They didn't used to but they do now.

Q. For how long a period of time did they adhere to the system of simply telephoning a message into the fire department without ringing the bell?

A. I don't know, sir.

Q. When did they start beginning to ring the bell and stop this system of telephoning without ringing the bell with a still alarm?

A. They telephone even now; but when they do they turn in a still alarm, which is two taps. That notifies the pumping station that there is a fire. I don't know when that change took place.

80 Q. So whenever a still alarm was given, prior to the time when this change was made, it was not communicated to the power house or company unless they sent a message from the fire department?

A. No, sir; by telephone or some way.

Q. Sometimes they did fail?
A. That's my recollection yes.
Q. Do you re-call anytime when they did?
A. No, sir; except I heard Mr. Preer telephone up there.

Objected to.

Q. Do you or not re-call on one occasion turning it in yourself or telephoning?
A. No, sir.
Q. Do you re-call who did call attention to it at the time of the fire at the St. Paul's Church?
A. Yes, sir; I heard Mr. Preer telephoning.
Q. After the fire had started?
A. Yes, sir.
Q. Why did he tel-phone, did anybody fail to telephone?
A. I don't know, sir.
Q. The pressure hadn't been turned on?
A. The gauge in the office didn't show it had been turned on.
Q. You had a gauge to show at that time?
A. I can't recollect,—yes, sir; had a gauge.
Q. How much did the gauge show at that time?
A. I don't remember.
Q. Well, was it as much as 50 pounds?
A. You mean after it was turned on?
Q. No, before?
A. No, sir.
Q. Do you re-call whether the pressure was sufficient after it was ordered turned on by Mr. Preer?
A. No, sir.
Q. You mean you don't re-call?
81 A. I mean I don't re-call the pressure.

Cross-examination.

(By Mr. WIMBISH:)

Q. Mr. Epping, how long have you been connected with the water works company?
A. October '98 is when I went in the office.
Q. That was your first connection in any capacity?
A. Yes, sir.
Q. You say you are familiar with the books of the company?
A. Yes, sir.
Q. When did their books begin?
A. In Feb'y. '91.
Q. Did you see any books prior to that time or prior to that date?
A. No, sir.
Q. None at all?
A. No, sir.
Q. What books did you find in the company's office?
A. Such books as the ledger, journal, cash book and the voucher record where the vouchers are entered and minute book and the water rent book and——

Q. Did you find stock certificate book?
A. Yes, stock certificate book was there.
Q. That all?
A. I think that's all. I don't know.
Q. You are the secretary as well as treasurer?
A. No, sir.
Q. Who had charge of the books of the Secretary?
A. I had charge of the books but I never attended any meetings.
Q. You were the book-keeper?
A. Yes, sir.
Q. For what quarter in what year did the city refuse payment of water rentals?

A. It was the bill that was due First of October. It was the
82 bill that we were to collect on the first of October, city bill.

Q. What year?
A. '92.
Q. 1902?
A. Yes, sir. If that's the year the bridge washed away why then that's the one: 1902 is right, yes. The city bill is collected in arrears and the water takers pay in advance. It was the bill for July, August and September that they declined to pay.
Q. Why did the city decline to pay that bill?
A. I did not present it myself. Mr. Preer presented the bill. I don't know.
Q. What was the condition as to the water service during those three months?
A. July, August and September? I think it was river water that we furnished up to about the 19th or 20th of September to part of the town.
Q. Why did you furnish river water?
A. Wasn't any water over in the reservoirs.
Q. What was the condition of the river water?
A. It varies, sir. Sometimes it is tolerable clear and then again it would be muddy, on account of the rains.
Q. I am speaking of these three months, not ordinarily?
A. It was pretty muddy—it was muddy.
Q. Did the water have a foul odor?
A. From the river?
Q. Yes?
A. No, sir; not that I know of.
Q. Have any odor at all?
A. I don't think it did.
Q. Was it fit for bathing?
A. No, sir; I don't think it was.
Q. Fit for domestic use?
A. Not unless it was filtered.
Q. It was not filtered?
A. Not by the company, no, sir.
Q. Did you ever collect that bill from the city?

A. No, sir.
83 Q. Did you ever try to collect it?
A. I never did at all.

Q. The company, so far as you know: you were the Treasurer of the company?

A. I think it was presented by Mr. Preer. He took it out as usual.

Q. Did you ever insist on payment?

A. No, sir.

Q. Did you collect from private water takers during those three months?

A. Yes, sir.

Q. You collected for it in advance, did you?

A. Yes, sir.

Q. You didn't know then how bad the supply was going to be, did you?

A. No, sir.

Q. Then the quarter for which the city refused to pay the rental wasn't the quarter during the time the 14 Street bridge was swept away?

A. No, sir.

Q. Mr. Epping, you testified that the amount expended in betterments from the first day of January, '91 to the first day of July, 1902, was $95,904.53. Was that all expended during those years by this company for the items enumerated here or for other betterments?

A. Yes, sir; for the items enumerated there, sir.

Q. Did the company expend any more money during that period for any other betterments?

A. No, sir.

Q. Then this represents the whole of their expenditure for betterments?

A. Yes, sir.

Q. The betterments consisting of the items you have enumerated?

A. Yes, sir.

Q. How much was expended for service pipes?

A. I will have to take the books to tell you.

Q. You don't remember?

A. No, sir.

Q. How much for meters and meter boxes?

A. I don't know them separately. Take it as a whole.

Q. Can you and will you prepare a statement and verify
84 it by your affidavit and hand it to the reporter, setting out the items composing the expenditure in betterments from the first day of January, 1891, to the 1st day of July, 1902 (95,904.53); and also attach the invoices for the goods that you obtained?

A. I don't think I can get the invoices, Mr. Wimbish.

Q. Do your books show the prices at which this material was purchased?

A. No, sir; they do not.

Q. You will be able to tell me the price at which they were purchased, won't you?

A. I don't know, sir. It will take sometime but I suppose it can be done.

Q. If you don't know that, how do you know it amounted to $95,904.53?

A. Yes, sir; it could be done; but I would have to go through the 12 years where it was distributed—all those vouchers and get it.

Q. Haven't you already done so?

A. No, sir. Took them in totals. I can show you easily in a minute or two how I got at it.

Q. I would like to know how you got at it?

(Witness refers to book in court room.)

—. You have pointed out what's called the voucher record, on page 80?

A. Yes, sir.

Q. Showing the totals of the various expenditures of the water company for the preceding period of three months?

A. Yes, sir.

Q. Among those items are extensions of services, construction and improvement account?

A. Those are the headings.

Q. You have made up your total exceeding $95,000?

A. Yes, sir.

85 Q. By a combination of all these totals in the books?

A. Yes, sir.

Q. You have not examined the vouchers?

A. Only from the time I went there; because most of this I distributed myself with the superintendent.

Q. That's '98?

A. From '91 to '98. I have not examined those vouchers to see whether the distributions were correct or not; but the books were kept by a mighty particular man before that time.

(By the MASTER:)

Q. You say these entries on page 71, and along there, were copies of these vouchers?

A. Yes, sir.

Q. Are they not entries from the vouchers and not copies?

A. Not exactly. Keep a distribution of the amount paid out on the book and the voucher being numbered and by name, according to what you see on the book; and when the voucher is entered those several things are done and the several items make up the total.

(By Mr. WIMBISH:)

Q. I still desire you to make up that statement called for in my previous question?

A. I think I can get it.

Q. When was this thirty thousand feet or whatever it was, for the Rose Hill connections, purchased?

A. In '94 or '95. I looked at the invoice the other day; but I don't re-call it. I can get it.

Q. Well, you purchased it on invoice?

A. Yes, sir; it was a contract. I can get the invoices—Yes, I

could get them all. Wasn't all shipped at once. The invoices came along separately.

Q. Get the invoices for the thirty thousand feet?

A. Yes, sir.

86 Q. In this $95,000, is there included the labor account?

A. Yes, sir.

Q. Have you got that separately stated on your books, the labor account?

A. Yes, sir.

Q. In your statement you will give what that amounts to?

A. Will be obliged to to make up that $95,000.

Q. Also show the cost of service pipes connections, meters meter-boxes, new mains, etc. for the Rose Hill Standpipe; and if there are any other items which go to make up the $95,000 will you please put them in also. Give dates as well as figures?

A. Yes, sir.

Q. Did you ever go fishing in the city mains?

A. Did I?

Q. Yes?

A. No, sir.

Q. Did you ever know of any fish being in the city mains?

A. No, sir.

Q. You never saw any yourself?

A. No, sir.

Redirect examination.

(By Mr. GARRARD:)

Q. Is it possible to go fishing in the mains, the iron mains?

A. No, sir; I don't think it would be.

87 G. T. PREER, sworn by the complainants, testified as follows:

(By Mr. WIMBERLY:)

Q. What is your connection with the Columbus Water Works Company?

A. Superintendent.

Q. How long have you been connected with the company?

A. I have had charge of the outside work since Feb'y, 1895.

Q. Were you connected with it in any way prior to '95?

A. By referring to the books to get the dates, I find that I began working for them in the early Spring of '92.

Q. From '92 to '95 what was the character of your work?

A. I worked for them during the Spring and summer of '92 and left in the Fall; and began work for them in the Spring of '93 and worked with them until '95 as collector.

Q. Since '95 up to the present you have been superintendent?

A. Well, yes, sir; I performed the duties of Superintendent.

Q. What are some of those duties?

A. Well, it is the general supervision of the physical part of the plant, looking after repairs and improvements.

Q. As such superintendent you are familiar with the condition of the system, are you?

A. Yes, sir, fairly so.

Q. When connections are made, house connections with private consumers, who makes those?

A. We have laborers to do the work and generally I am there present, unless there is some other matter, more important work that requires my attention.

Q. Generally speaking you are present?

A. Yes, sir.

88 Q. They are made by uncovering the pipes in the ground?

A. Yes, sir.

Q. In that way you can tell what the character of the pipes is?

A. Yes, sir.

Q. What sort of material are the pipes made of?

A. Cast iron.

Q. All of them?

A. Yes, sir: They are coated with some sort of a preparation, I don't know exactly what.

Q. Some sort of paint or covering?

A. Yes, sir; inside and out.

Q. Now on the bridge, what is the character of the pipes across the bridge?

A. Wrought iron pipe now and was prior to the time the bridge was washed away.

Q. Why is the difference between the bridge and the other?

A. I suppose on account of the difference in the weight of the pipe. Wrought iron is thinner and lighter and easier to handle.

Q. Doesn't make as much load for the bridge to carry?

A. No, sir; less liable to be broken by any accident.

Q. Those that are in the ground they are of cast iron?

A. Yes, sir; except the service pipes.

Q. The service pipe belong to the consumer—are put in by the consumer?

A. No, sir; the company furnishes the service pipe to the edge of the sidewalk.

Q. Do you know about that plug there?

A. I don't know of my own knowledge. At the time this tap was made, I was superintending the laying of a 12 inch main on First Avenue; and I sent my foreman down to make this tap.

89 Q. You are familiar with the kind of pipe it is?

A. Yes, sir; I have cut into it.

Q. Does that represent fairly the average quality?

A. Yes, sir; it does.

Q. When you cut into these pipes to make connections, tap them for any cause, replacing or changing the size of valves, anything of that sort, can you tell what their condition is?

A. When we have to cut in a large connection, where the water is cut off, we cut the pipe in two and we can readily see the condition of the pipe. Of course tapping against pressure we never see.

Q. These others you can?
A. Yes, sir.
Q. Generally speaking when that is done you are present?
A. Yes, sir.
Q. And see it?
A. Yes, sir.
Q. What is the character or condition of the pipe as to poisons presence of impurities or mud or anything?
A. Well, sir, prior to this year I had never noticed anything more an a little sediment right in the bottom of the pipe and a few tle barnacles, and rust may be. The pipe always appeared to be good as it was when it was put in.
Q. Any of them rusted or corroded to the extent of weakening e pipe?
A. No, sir; not to that extent. The rust that forms on them seems be outside of this coating or paint. The paint is between the rust id the iron.
Q. How thick is the coating?
A. It is not covered up, simply a little carbuncles about scattered er it.
Q. Merely show about how thick it is ordinarily?
A. Sometimes they protrude a little more than this. (Referring to specimen in court.) That does not show carncles at all. That's just the pipe.
Q. The pipe that has been laid since your connection, the mains, of what size?
A. We have laid six, eight, 10 and 12 inch I believe. Nothing naller than six.
Q. Six is the smallest since you have been superintendent?
A. Yes, sir.
Q. You say you first went with the company in 1892: You can ell, I suppose, when you cut into a pipe the age of it approximately?
A. The condition of the pipe inside? I don't know that I could ell so much about the age. All looks about alike except pipes that ave been put in within the last few years.
Q. Do you know the last four inch pipes put in the system?
A. Do not.
Q. Have there been any laid since '91?
A. I could not say. None since '95, I know.
Q. That's as far as your knowledge goes back?
A. To the best of my knowledge none since that.
Q. In a general way can you give the amount of pipe that they ave laid since '95, as compared with what was before, the total umber of miles of mains?
A. I can give it approximately in feet. We laid about 30,000 eet of six inch pipe and I should say about 3500 of eight inch pipe.
Q. How much ten?
A. Only laid three hundred feet of ten.
Q. How much 12?
A. Up to the present time we have laid, let me see, about 6000 eet.

91 Q. That pipe you speak of, the 30,000 feet of six inch, and the other quantities they have laid since what time?

A. I would like to say—I intended to say the 30,000 feet of six inch pipe was laid at the time we put water on the Highlands. Prior to that we laid two blocks on Front Street and about 1500 feet on Hamilton Avenue and I suppose about 35,000 feet, nearly, of six inch pipe would cover it.

Q. Since '95?

A. Yes, sir.

The MASTER: You want to correct that first figure of 30,000 feet?

A. Yes, sir.

Q. In addition to the pipe have you put in other fittings since you have been connected with the company?

A. Yes, sir; we have placed a number of fire hydrants for the city's use.

Q. Do you know about how many or would you have to get the figures from the books?

A. Yes, I can tell approximately: We have actually put in since '95, I believe, about 48 hydrants.

Q. What are dead ends—How come there to be dead ends in the system?

A. Well, sir, it is simply where they branch off from a line of pipe and run to the end of a street and stop—to a hydrant. They are generally in a territory where there are very few consumers.

The MASTER: I understand that there is a fire hydrant at every dead end where they run out that way?

A. Yes, sir. Right at the end.

Q. In the lower part of the city—the older part of the system, have you from time to time connected up any of these dead

92 ends?

A. We have, sir. We have connected several of them in the lower part of the city.

Q. The number of dead ends, I suppose, can be gotten from the map—the pipe map will show?

A. Yes, that exist now.

Q. The location of these mains, who determines that, the water company or the city?

A. The city. We generally consult the superintendent of public works as to the location of the mains in the streets.

Q. He gives you the location?

A. Yes, sir.

Q. You locate them like the city directs?

A. Yes, sir.

Q. As to locating these that may be on dead ends, the city locates them?

A. They are put in according to the city's directions.

Q. Taking up this map now: Where is it the new part of the city begins, what street—Is it 17th Street?

A. We have water as high up as 19th Street on Third Avenue and

econd Avenue and 18th on First. All above 18th on First and 9th on Second and Third is new.

Q. All in the upper part of the city above those streets is new?

A. Yes, sir.

Q. The part that you put pipes in before the last change in your ystem, that was lower than the other and did not require the same eneral changes in your system that were required to run it up the ill?

A. I don't understand.

Q. You spoke of having some along there?

A. Dead ends?

Q. No, you spoke of having some portion of the pipes laid in the nnex?

A. Yes, sir.

3 Q. How does the ground lay as compared to that you more recently put in?

A. Third Avenue was the highest point—Third Avenue and 19th Street, I believe. The other was low, First and Second.

Q. To run this, that's the time you put in the pumping station?

A. No, the pumping system was to supply Rose Hill, North Highands and East Highlands.

Q. They are the more elevated portions?

A. Yes, sir.

Q. Taking the map here: This gives the location of the pipes, loes it?

A. Yes, sir.

Q. Now when you speak of dead end, you mean below the part of the pipe—below where it is last connected together?

A. Yes, sir.

Q. On what Street—to what street do these dead ends extend—below what street?

A. Below Sixth Street.

Q. What you call a dead end is where it runs down and does not come around and come into another pipe?

A. Yes, sir.

Q. So the dead ends in the system is the part below Sixth Street?

A. No, sir.

Q. I mean in the older part of the system?

A. Yes, in the older part.

Q. The only dead ends in the older part of the system are those below Sixth Street?

A. No, sir.

Q. Is that right?

A. Here is one on 7th Street and 9th Avenue.

Q. Seventh Street and 9th Avenue there is one?

A. Yes, sir. And on 10th Street and Ninth Avenue.

94 Q. What street is this?

A. That's 12th Street.

Q. Are there any dead ends inside of the older part of the city between Sixth Avenue and the river and between Sixth Street and

the Annex—I mean in the portion of the city on which Sixth Street is the lower bound-ry?

A. I can tell exactly by this map. I was trying to get it from recollection. I don't think there is—yes, there is one on 13th Street and 5th Avenue and one on First Avenue and 14th Street.

The MASTER: Does that map show it?

A. Yes, sir.

(By Mr. WIMBERLY:)

A. One block here 12th to 13th?

A. Yes, sir. (Referring to map.)

Q. What Avenue?

A. Fifth Avenue.

Q. What's that? (Referring to map.)

A. On First Avenue and 14th.

Q. How long is that?

A. Two blocks. This other is one.

Q. Let's take up these dead ends: Nearly all these, about half, I believe, of the dead ends are below Sixth Street: What is the character of the city down below Sixth Street and the nature of the buildings and improvements on it?

A. Well, sir, on First Avenue there are a good many nice dwellings. We have most of our takers on First Avenue below Sixth Street, that is, in that portion below Sixth Street; and the other is mostly negro houses.

Q. First Avenue is the only one, you say, that have houses of any size much below Sixth Street?

A. Yes, sir.

95 Q. This is First Avenue?

A. Yes, sir. I should have included Broad.

Q. This is First Avenue, is it?

A. Yes, sir.

Q. Now take up Broad Street where you say you have more takers, is that along down there six or four inch?

A. Six.

Q. The other dead ends you speak of below Sixth Street on 4 or six inch?

A. First Avenue Four and the rest is six.

Q. Only one dead end that is a four inch pipe?

A. Just one block, yes.

Q. And the other dead ends are six inch pipes?

A. Yes, sir.

Q. Let's take the dead end that runs out on Seventh Street, Seventh Street and Ninth Avenue, what size pipe is that laid there?

A. Six inch.

Q. And the dead end that runs out to Ninth Avenue?

A. Is a six inch.

Q. That's a six inch?

A. Yes, sir.

Q. And the dead end that runs out to the end of 11th Street, what size pipe is that?

A. That is 8 inch out to 9th Avenue and six the balance of the way.

Q. To the edge of the city?

A. Yes, sir.

Q. That's the size marked on the map?

A. Yes, sir.

Q. What's the effect on the pressure where there is a hydrant at the end of it—what is the effect of the hydrant as to giving it circulation?

A. Well, sir, if there is only one hydrant on the end of a line or pipe that has not any other connections, gives very good service. Where there may be two openings, both hydrants cut down

96 the pressure.

Q. Where they are both opened at the same time?

A. Yes, sir.

Q. Taking up these dead ends below 6th Street, how many of those have more than one hydrant on them?

A. There are three lines there.

Q. Those three have more than one hydrant: What size lines are they?

A. All six.

Q. Is there a four inch dead end that has more than one hydrant on it, in the older portion of the city I am asking about now?

A. There is not.

Q. Mr. Preer, in the newer portions of the city, the Annex, are there any four inch pipes at all?

A. No, sir.

Q. The smallest size is six?

A. Yes, sir.

Q. Have you laid any four inch recently for anybody?

A. Except service pipe.

Q. Just for service pipe?

A. Yes, sir.

The MASTER: Any difference between the pressure on a four and a six inch pipe?

A. Not unless there is an opening opened up. A four inch pipe won't afford as much water, under the same pressure through the same opening as a six would.

Q. A four inch pipe won't supply as many fire hydrants at the same time as a six inch, that right?

A. No, sir.

Q. What's the size of a fire hydrant—what size stream?

A. Hose connection is 2½ inch.

Q. Where you have only one fire hydrant, the stream that goes through a four inch pipe is bigger than you can get into the fire hydrant?

A. Yes, sir.

97 Q. It diminishes the pressure where you have a number of hydrants on a small pipe?

A. Yes, sir.

Q. I understand you to say on these dead ends, that there are none of them, which have a four inch main, more than one hydrant?

A. There are not.

Q. I will ask you: in the older part of the city how many dead ends, even taking a larger size, six inch, that have more than two hydrants on them where it becomes a dead end?

A. There are none.

Q. None of the dead ends, as you call them, have more than two hydrants on them?

A. No, sir.

Q. None of the four inch dead ends have more than one hydrant?

A. That's correct.

Q. I will ask you, where there are only two plugs, or a six inch pipe with only two hydrants, for a comparatively short distance, is a six inch pipe large enough to give sufficient pressure?

Objected to.

Q. What size pipe is sufficient to give you pressure where there is beyond the connected part, a distance not exceeding a couple of blocks, not exceeding two hydrants on any one line?

Objected to.

The MASTER: I don't see any objection to that question.

Mr. WIMBISH: I object to the form of the question in the absence of anything else. I don't know what pressure he is speaking of.

The MASTER: Let him answer that.

98 Q. Can you answer that?

A. Not less than six?

Q. Mr. Preer, what's the advantage, in the matter of pressure, of larger pipes?

A. The friction is less.

Q. Is the friction loss greater in short lines or long lines?

A. Long lines.

Q. What's the effect where the system is coupled up from both sides, where there is a connection that connects these different pipes together, what effect has that on increasing the pressure?

A. Well, sir, it affords a better supply of water when you are using—have an opening opened at some point and the water comes from more than one direction.

Q. In laying these pipes in the distance of a single block, is the loss from friction considerable or comparatively slight?

A. Well, sir, it depends upon the size of the pipe.

Q. Take six inch pipe?

A. I am not experienced in the matter of friction in pipes; but a distance of one block in a four inch pipe amounts to considerable.

Q. How is it on a six inch?

A. Well, sir, I never noticed that there is very much. I gained my experience through practice.

Q. In the newer part of the city, the Annex, you say you only

have a six inch pipe there: Who determines the location of the pipes and the amount of dead ends?

A. The pipe lines are mapped out by the city, I suppose the Water Works Committee and the Superintendent of Public Works
99 directed us where the mains were to be laid in the streets.

Q. The size of the mains themselves made known to the city?

A. I think it was agreed upon.

Q. I will ask you if it has been possible to connect up all these dead ends, if not, why not?

A. The only thing that is necessary is the money to buy the pipe.

Q. In a growing town, where you are laying new pipes, do you select your own locations and connect up as you lay it or do you have to do that later on?

A. I suppose it depends a great deal upon the amount of income that would be received from that territory.

Q. Take the location where you have these dead ends below Sixth Street, what would you say as to the amount of water consumed down there?

A. There is practically none outside of Broad and First Avenue, except the city's fire hydrants.

Q. What is the height of the buildings, generally speaking in that part of the town?

A. Generally one story buildings.

Q. Can you tell from the map here what were at one time dead ends that have been connected up since you have been superintendent?

A. Yes, I can tell you from the map and from recollection. We connected up two blocks on Front Street, from 7th to 9th Street. One block on Fourth Avenue from 8th to 9th; and then on 6th*er* Avenue there was laid, after the Rose Hill pipe was put in,
100 connected up the dead ends there from 6th to 12th.

Q. It was so laid as to have the effect of connecting up what was then dead ends?

A. Yes, sir; connected two blocks of six inch here (Indicating on map) and then on 6th Avenue to Sixth Street straight through, the mains on 12th, 10th and Sixth Streets.

Q. Is there a fire hydrant located at the corner of 7th Avenue and Sixth Street now?

A. Sixth Avenue and Sixth Street.

Q. Sixth Avenue and Sixth?

A. Yes, sir.

Q. When was that hydrant put there?

A. I will have to guess at that because I can't remember dates very well: To the best of my recollection, though, it was put there shortly after we completed the work on Rose Hill, which must have been about 1900.

Q. Do you remember how it came to be there—to be put there?

A. Yes, sir. That hydrant was put there to make a test of the pressure when the Rose Hill Stand pipe and the power pump were turned into the lower city; also put there at the same time that line

of pipe was laid from Sixth to 12th and the other hydrants were placed on it.

Q. Who selected the place to make the test?

A. I don't know, sir.

Q. Was it done by the city: Did they select the place? Do you remember that?

A. I think it was an agreemnt between both parties, the water works company and the city.

Q. It was put there at that time?

A. Yes, sir.

101 Q. When you took charge of the older works of the system, as it then stood, what sort of a system did you have—how did you get pressure?

A. By gravity.

Q. When the Rose Hill annex was brought into the system, what changes did that necessitate?

A. Pumping the water into the Rose Hill standpipe to supply the higher districts.

Q. When was that pumping station put in, pumping engine and necessaries?

A. I think, sir, about 1899 or 1900. The year the soldiers came here, I know.

The MASTER: What?

WITNESS: The year the soldiers came here we started to pumping water for them.

Q. That pumping station, and the improvements they put in, was during the time you have been superintendent?

A. Yes, sir.

Q. When was the Rose Hill standpiue built?

A. I think the Rose Hill standpipe was built a year—may be a few months more than a year, prior to the time we laid the mains on Rose Hill.

Q. Was that during the time you have been in charge?

A. Yes, sir.

Q. Besides these additional mains and couplings and hydrants in the lower part of the city, you have changed—you have added to your original gravity system the pumping system?

A. Yes, sir.

Q. And the increase of pressure due to that and the Rose Hill standpipe to all the system supplying that part of the city, is that right?

A. Yes, sir.

Q. That change on Rose Hill is that what led to the change to the pumping system of pressure from the pumps?

A. Yes, sir.

102 Q. How much additional expense was entailed, do you remember: Are you familiar enough with the figures to say?

A. Yes, sir. Including the building of that standpipe, I suppose it cost close down to $40,000.

Q. In addition to that first cost, what has been its effect on the

cost of operating the system, the effect of the change from gravity system to a pumping system—operating expenses?

A. It increased the expenses considerably.

Q. How much would it increase the expense?

A. You mean before it went into the hands of a receiver?

Q. Leaving out the filter—have not come to that yet: The first part, before the filter?

A. It cost us, I suppose, about $60. per month.

Q. Is that in addition to the wear and tear on the machinery?

A. Yes, that was for the power. That included the operation.

Q. That was in addition to the wear and tear and the interest on the first investment?

A. Yes, that was simply—just the cost of the power for operating the machinery.

Q. What was the effect on the pressure in the lower part of the city of the change from a gravity to a pumping system?

A. In case of fire we could increase the pressure.

Q. How do you make that increase: I mean when you want to turn it on?

A. There was an alarm constructed at the power house; and when the fire alarm was turned in, this gong would ring and they
103 would start their pump. If the fire was below the Rose Hill district, at that time the pressure would be turned into the lower part of the city from the Rose Hill standpipe and the pump.

Q. Who did that?

A. For a short while it was done by Mr. Keene at the Columbus Railroad Company's car barn at 17th Street; and later the pressure was put on down as low as No. 1 engine house on Broad Street; and a by-pass laid around the standpipe there; and a valve put in this by-pass right in the rear of the engine house and a brick house built around it, which opened right into the engine room; and the pressure was turned in by Mr. McKerley, the engineer.

Q. Engineer for who?

A. For the city.

Q. How long does it take to turn that in when they desire or need it?

A. About two minutes, I would say.

Q. Why wasn't it kept turned on all the time?

A. Well, sir, at that time it would have required us running the pump night and day and increased the expense to such an extent——

Q. No necessity for it except for fire purposes?

A. Had gravity pressure for domestic purposes.

Q. That sufficient for all purposes except fire, gravity pressure?

A. It was. There was some few complaints the last year before the receivership.

Q. Ordinary gravity pressure was all that was needed for domestic purposes?

A. Yes, sir.

Q. For fire you could get it in two minutes by turning it on?

A. Yes, sir.

Q. How much would that increase the pressure in the lower part of the city where you turned it on?

104 A. It varied from 40 to 70 pounds.

Q. You spoke of a test being made at the time the Rose Hill additions were completed, how come it to be tested—Were you present at that test?

A. Yes, sir.

Q. Do you remember about the date of it—approximately the date?

A. No, sir; I think it was in the summer of 1900.

Q. You gave it in your affidavit April 1900: At that test—You say that test took place where?

A. At the intersection of 6th Street and Sixth Avenue.

Q. What amount of pressure did it show?

A. Well, sir, I think it went as high as 70 and low as 41 at that test.

Q. Did you find out why it dropped to 41?

A. Yes, sir; they opened a hydrant over acress the block at the Southern Rd. shops to fill an engine tank.

Q. Do you furnish water to the railroad company?

A. Not through that hydrant. We furnish it through a meter.

The MASTER: What was the average pressure before the test—what was the average pressure before you turned on this valve that raised the pressure from 40 to 70?

A. Well, sir, the average, I suppose, would have been about 25 pounds. Got a little lower at times and higher at night.

Q. That means if you didn't turn it on at all, that would be the pressure?

A. Yes, sir; that's the pressure for the domestic use in the lower city.

Q. That's the domestic pressure?

A. Yes, sir.

105 Q. Going back to this test, filling the tank of the engine, is that one of the purposes that the railroad gets water for, or do you know?

A. Yes, sir; it was using the water for that purposes; but it is against our regulations for them to use it except through the meter.

Q. Did they use this through the meter?

A. No, sir.

Q. You say that caused the pressure to drop down so?

A. Yes, sir.

Q. When they quit using it for that purpose was there any re-toration of the pressure?

A. Yes, sir.

Q. Went back up?

A. Yes, sir.

Q. Was there any other test had by the city of the system?

A. My recollection is that a few days after that there was. I don't know of my own knowledge that there was.

Q. You were not present?

A. I was told, I think, by the chief of police.
Q. Chief of the Fire Department?
A. Yes, sir.
Q. Working for the city at the time?
A. Yes, sir.
Q. He was the man that made that?
A. I don't know, sir.
Q. You don't remember?

Objected to.

The MASTER: He stated that the chief of the fire department stated it.

WITNESS: That's my recollection.

Mr. WIMBISH: The chief is available, Mr. Burrus.

The MASTER: He is not trying to prove what the man said. He said he made the test.

Mr. WIMBISH: That may be admissible in the absence of
106 better evidence. Hearsay evidence is not admissible when the witness himself is admissible.

WITNESS: I would like to state that I am not at all sure about that. I have to depend upon my recollection only.

Mr. PREER:

Q. Has any of this cast iron pipe shown any signs of decay or wearing out?
A. No, sir; I have not noticed any except little carbuncles of rust that I spoke of.
Q. Is that such as to damage or weaken the pipe?
A. Not in the least.
Q. What is the life of cast iron pipe, do you know?
A. I don't know, sir. I think it would last always, the way——
Q. I will ask you whether you were acquainted with Mr. John Hill and W. R. Brown?
A. Yes, sir; I was.
Q. The committee that is named in these records as representing the city?
A. Yes, sir.
Q. Who was Mr. John Hill?
A. He for a long time was connected with the Eagle Factory here.
Q. Connected in what way—what were his duties?
A. I think he was superintendent. He was engineer also, I believe.
Q. Civil engineer you mean by engineer?
A. I know he was there; but I don't know whether he was civil engineer or hydraulic.
Q. He was in charge you say of their works?
A. Yes, sir.
Q. What construction work did he do afterwards having relation to hydraulics?

A. I can't give that of my own knowledge. I know he
107 had charge or superintendent of the mill there.

Q. What was his reputation as an engineer in the matter of hydraulics at the time——

Objected to.

Mr. WIMBERLY: He is dead and I think it is competent to show that he was a man of standing in that line of work here.

Mr. WIMBISH: They can show his employment and what he has done.

Objection sustained.

The MASTER: You can show what Mr. Hill did and the character of his employment.

Q. What was the nature and character of the work he did here, Mr. Hill, in this community?

A. Well, sir, I think his work—his active work was done prior to the time I came to Columbus.

Q. Did he build the dam for the Eagle & Phenix—That built while you were here?

A. No, sir.

Q. Did he build the dam above town?

A. I think it was built since I have been here but I don't remember the time. I have always heard it said that he built it. That's the only way I can put it.

Q. How long has Mr. Hill been dead?

A. I judge about 3 or 4 years.

Q. Did he build the dam of the Bibb Mills just a few years ago—I mean the engineer in charge of building that dam?

A. I know that Mr. Hill was interested in it and was connected with it but I don't know that he was the engineer.

108 Q. He was the consulting engineer, you know that fact?

A. I don't know that fact either.

Q. Who was Mr. W. R. Brown?

A. He was President of the Columbus Iron Works.

Q. What sort of works is the Columbus Iron Works?

A. Machine shop and iron foundry—castings.

Q. Cast iron pipe in his line?

A. They made fittings. Didn't make pipe.

Q. Fittings to the pipe?

A. Yes, sir.

Q. Mr. Preer, at the time this extension was made to Rose Hill, did you have private takers there or was it laid for the city?

A. It was laid for the city chiefly.

Q. How many private takers did you have at that time in that neighborhood?

A. They were procured very slowly. Have a good many now. I suppose the first year the takers didn't exceed sixty.

Q. In the whole Annex?

A. The first year. After that they came along slowly.

Q. Did you have any contracts at all from private takers at the time the work was done?

A. I believe Mr. Kirven verbally said he would take it as soon as we got the pipe laid up there.

Q. Mr. Kirven?

A. Yes, sir. May be a few others. No contracts gone into.

Q. Do you know the height of the Rose Hill standpipe?

A. Yes, sir.

Q. How high is it?

A. 120 feet.

Q. Its base is how much higher than the standpipe on Broad Street?

A. About 80 feet, I believe.

109 Q. Makes a total difference of some 200 feet does it?

A. Yes, sir.

Q. What has been the character of the pressure furnished for fire service during the time you speak of from '95 to the present?

A. Well, sir, in '95 it was gravity pressure and I suppose it would average 35 pounds.

The MASTER: You mean for domestic or for fire?

A. The whole city.

Mr. WIMBISH: It is the same thing.

WITNESS: It was at that time. I didn't finish my answer. I stated the pressure in '95, when I took charg- averaged about 35 pounds——

The MASTER: For the general system?

WITNESS: Yes; and then as the city grew it decreased some, the average, you might say.

Q. Since you have had the Rose Hill standpipe, when you speak of domestic pressure being 35, that is the condition it is in when you don't turn on the fire pressure?

A. No, that's the condition before the receiver took charge, not now.

Q. I mean when you didn't turn on the fire pressure?

A. Yes, sir.

Q. During the time—we will take it up by years and see the average: You say in '95 it was about 35 pounds?

A. Yes, sir.

Q. What time was it you got the Rose Hill standpipe erected, what time was that?

A. We began using it in 1900.

Q. How was the pressure between '95 and 1900?

110 A. The average grew less until 1900.

Q. How was it in '96, '97, '98 and '99?

A. I could not say exactly; but it must have dropped off gradually, nearly ten pounds in that number of years.

Q. What time was the work begun that furnished the pump and Rose Hill pressure—what time was that work begun?

A. In the summer—in June, I believe, of 1899.

Q. That the actual work begun?

A. Begun—I started laying pipes on Rose Hill.

Q. Do you remember what time the plan was made to start into Rose Hill?

A. Well, the agreement was made only a short time prior to that between the city and the company.

Q. About what was the pressure at the time you made that change of plans?

A. Our pressure at times was as high as 40 pounds. During days when the use of water was considerable, it would get down as low as 20 pounds.

Q. That was during what time of day?

A. Speaking of the average pressure. Of course we would have to strike an average between the maximum and the minimum.

Q. Since the work has been completed in 1900, has there ever been any failure of pressure?

A. Well, sir, I never knew it to fail altogether except when the bridge washed away.

Q. How long after the bridge washed away before the company adopted emergency measures?

A. I would like to state that there may have been one or two instances when the pressure was low.

Q. Speaking of the washing away of the bridge, how long
111 was it before the pressure was restored?

A. Thirty days exactly.

Q. Was the work begun promptly?

A. Yes, sir.

Q. Could it have been restored any quicker that that?

A. Not unless we could have gotten the material faster.

Q. Was it difficult to get the material?

A. We had some trouble. We had to buy the wrought iron pipe from Chicago, up in the Northwest somewhere.

Q. You have already explained that it took wrought iron pipe to cross the bridge?

A. Yes, sir.

Q. Was that the city's bridge that washed away and carried your pipe?

A. Yes, sir.

Q. Did any other accident happen to your works about the same time—did you have any other?

A. Well, sir, sometime, a few months after the bridge washed away, I think there was some mistake made, a valve cut off across the river by some employé of the factory and had the water cut off for a few hours.

Q. When the bridge washed away did you have a submerged main?

A. Yes, sir.

Q. That also brought the water across the river?

A. Yes, sir.

Q. What became of that?

Q. Well, sir, when the bridge washed away I immediately turned the water through the submerged main. The pressure had dropped to about 15 pounds, to the best of my recollection. At the time I got the submerged main turned on, at a late hour of night the pressure had risen up to about 20. I don't remember exactly.

112 Q. Still rising?

A. Yes, sir. The next morning Mr. Richard Howard telephoned me about — light that there was not any pressure; and we found that the submerged main had broken loose.

Q. What broke that loose?

A. Well, sir, I have always thought that it was the falling of one of the piers of the bridge. It seems, according to the gauge, to have gone down at the time of night they say this pier fell.

Q. Pier to the same bridge that washed away?

A. Yes, sir.

Q. So those two accidents together cut off the water?

A. Yes, sir.

Q. You had to make some new arrangements, get the pipe to get the water into the city?

A. Yes, sir.

Q. Up to that time, from the time they had turned the Rose Hill standpipe in, in 1900, how was the pressure?

A. Up to 1900?

Q. No, from 1900 up to the time the bridge washed away?

A. The part of the city supplied by gravity had an average pressure of about 25 pounds.

Q. The pressure, however, they could have gotten by turning on——

A. In case of fire?

Q. That's the pressure I speak of?

A. Yes, sir; the pressure obtained from turning in the Rose Hill standpipe and the power pump would vary from 40 to—I have seen it as high as 80.

Q. When it was turned on, when they made a connection, you say they could make it in about two minutes the Rose Hill
113 water, anytime between 1900 and 1902, was there ever less than 40 pounds pressure?

A. I don't know when the iron works fire occurred exactly. We used both pumps. Good big fire; and the pressure was cut down—I think 33 was as low as it got—I won't be sure. I passed back and forth from the pumping station to the office and looked at the gauge.

Q. What caused it to get low on that night?

A. The great amount of water that was used.

Q. That a very unusual quantity of water?

A. Yes, sir.

Q. How long was that fire going on?

A. Well, sir, we pumped water all night.

Q. All night long?

A. Yes, sir.

Q. When did the fire start?

A. I think in the early part of the night, about seven or eight o'clock.

Q. How long was it that they still used the water on it?

A. They used water all night and the next day.

Q. What was the size of the area covered by that fire?

A. I suppose 6 or 8 acres. About two blocks.
Q. The fire spread over the whole distance, did it?
A. Yes, sir.
Q. How many streams were turned on?
A. I don't know, sir.
Q. I mean was there one or two or quite a number?
A. Quite a number. All they could get.
Q. Did they use all the hose they could get?
A. Yes, sir.
114 Q. And as many streams?
A. Yes, sir.

(Court here took a recess for dinner.)

Afternoon Session.

Court met pursuant to recess and the trial of the case proceeded.

(Examination of witness G. T. PREER was resumed by Mr. WIMBERLY:)

Q. Mr. Preer, that Columbus Iron Works fire, what was the nature of the fire—what was burned up?

A. Well, sir, the buildings, which consisted mostly, I believe, of lumber frame buildings; and I believe there was considerable lumber burned that they had there; and the railroad trestle, wooden trestle and a good many small buildings, frame houses and warehouse.

Q. You say lumber, what shape was the lumber in?

A. The lumber was piled up on the west side; and a good deal in the Southern Plow Works that they were working up into plow handles and beams.

Q. I believe you spoke of something about a warehouse what sort of a warehouse was that?

A. There was a lot of jute bagging stored in the warehouse.
Q. Where was that now, that warehouse?
A. Corner of Broad and Dillingham Streets.
Q. Well, state as to the character of the fire?

A. Well, sir, it was just simply a terribly hot fire, so much inflammable stuff there and these frame buildings. It seemed to get beyond the control of the firemen in fact. I didn't see it
115 when it first started. At the time I saw it the fire was raging.
Q. Did they use the fire engines?
A. Yes, sir.
Q. What was the date of the fire?

A. I don't remember the date. I think I can get the date pretty close though. We had just finished laying a 12 inch main down First Avenue the day before the fire. That was in April and the year, I believe, the bridge washed away.

Q. April 10, 1902. That's the date given in Mr. Pearce's affidavit?
A. Yes, sir.

A. There should be a hydrant there (Indicating). There was one there.

Q. The fire November 27, 1902, mattress factory: What sort of a building was that, residence and mattress factory?

A. The residence was a frame building and the mattress factory was covered with corrugated iron.

Q. What size building?

A. Small building, looked to me to be about 20 x 24, something like that.

Q. It was not as big as the Eagle & Phenix factory?

A. No, sir; both were small buildings.

Q. What sort of material was it filled with, inflammable?

A. Yes, sir—I don't know of my own knowledge it was. They make mattresses out of cotton and this excelsior.

Q. Filled with that sort of material?

A. I don't know of my own knowledge that it was.

Q. That's what they use in making mattresses?

A. Yes, sir.

Q. Did you see that fire?

A. Yes, sir; I was present and saw that.

144 Q. How was the pressure there?

A. They were able to throw the water on top of the building; and in fact I noticed particularly on this corrugated building for sometime before they could break into it, they threw water on the outside of it.

Q. While the fire was on the inside?

A. Yes, sir; had to break into it to get to the fire. Put it out soon afterwards.

Q. As soon as they broke in?

A. Yes, sir.

Q. Did they break in finally?

A. Some of the firemen took an axe and tore a hole in the side of the building.

Q. After that you say the fire was put out?

A. Yes, sir; the stream I noticed. May have been doing something else on the other side.

Q. You saw the streams playing on it, how was the pressure?

A. They were able to throw the water on top of the building.

Q. You speak of still alarms: has the city corrected that evil in any way, as to your gong?

A. I see in their revision of the fire alarms they strike two when a still alarm is received.

Q. They have two gongs now?

A. Yes, sir.

Q. At that time they did not?

A. No, sir.

Q. During the time you have been here as superintendent, from '95 up to the present, in addition to these 10 or a dozen fires that they made complaint, have there been other fires?

A. Yes, sir.

145 Q. About how many fires do they have a year here, do you know about how many?

A. Well, sir, quite a number of alarms; but don't have a great many serious fires. Don't have the slightest idea how many.

Q. Those mentioned in Mr. Pearce's affidavit the only ones in which you have heard of any complaint?

A. I think so, yes, sir.

Q. And the other numerous fires you have had here, during the seven years you have been superintendent, was the pressure all right then?

A. I don't recall any complaint being made. If there was I can't re-call them now.

Q. When a complaint was ever made of any defect——

A. (Interrupting.) I would like to state that I have noticed nearly every fire where there was an account printed in the paper, they often referred to the pressure being poor.

Q. I am not asking what the paper said.

Mr. WIMBISH: I ask that that be allowed to come in. It was brought out by his own witness.

The MASTER: I don't think what the paper stated would be proper evidence.

Q. I was going to ask you when I was cut off, whether the city, through its Mayor or its Council or its official heads, ever addressed any complaint to you, or came to your knowledge, as to the pressure at any of the numerous fires during the time you have been superintendent?

A. Yes, sir; the chief of the fire department, but I can't
146 remember the fires, at times claimed that they didn't have sufficient pressure.

Q. Those the fires Mr. Pearce testified about?

A. Yes, sir; most of them. I don't think he ever said a word to me about some of those fires; and others he spoke to me about.

Q. How often?

A. I don't remember.

Q. I mean very often?

A. No, sir; some of the fires there was no complaint and then others there was complaint.

Q. Have you yourself attended most of the fires?

A. Yes, sir.

Q. From your actual observation, what you have seen yourself, how has the pressure been, generally speaking, at these different fires?

A. It has been poor at some of the fires.

Q. What's that?

A. It has been poor at some of the fires—low.

Q. How often?

A. I can't re-call. I can name them, I think, I have noticed.

Q. Name the ones where there has been poor pressure?

A. The Phillips fire and the Garrard fire, where those houses burned.

Q. Phillips and Garrard?

A. I stated the pressure during the Iron Works fire to be 33 pounds.

The MASTER: Have you been over these fires?

A. Those are the only ones I can re-call that the pressure was low.

Q. The Garrard fire I have questioned you about?

A. Yes, sir.

147 Q. Those are the two where they had long lines of hose, is that right?

A. Yes, sir; and the pressure was low. You asked me if I knew. You didn't ask me then as to the pressure.

Q. Generally speaking—you have mentioned those two—generally speaking how has the pressure been?

A. It has been sufficient, that is, up to the contract. Don't claim that to be sufficient. Thirty two pounds is not enough.

Q. Thirty two pounds is sufficient supplemented by an engine?

A. Yes, sir; they can take suction with five pounds.

Q. Thirty two pounds will raise it how many feet—how many feet high?

A. You can raise a column of water with thirty five pounds about 72 or 73 feet. Would throw water out of a nozzle that high. If you had a nozzle I really don't know. I suppose about 60 or 70 feet.

Q. Somewhere in that neighborhood?

A. Yes, sir.

Q. It gies that much to start with and it flows into the engine and they have to supplement it with more?

A. Well, sir, they can always get water by suction of the engine, unless there is no water in the pipes at all.

Q. You spoke of fires when there has been no connection with Rose Hill: When there is a connection with Rose Hill, with your pumping system, what pressure can you get?

A. At the Iron Works fire, which is as low as I can re-call

148 and the Garrard fire they were both about the same, about 32 or 33 pounds, may be 35; and higher than that at the beginning of the fire.

Cross-examination.

(By Mr. WIMBISH:)

Q. Mr. Preer, has the upper reservoir any thin edges or is it marginal edges?

A. Has thin edges.

Q. How much of that reservoir is filled in by the washings from the hill sides and other causes since you have known it?

A. I don't know, sir.

Q. Would you say a thousand feet at the upper end has filled in?

A. No, sir; I can't say.

Q. Would you say that it was more or less than that?

A. I don't know exactly how you mean thousand feet: Cubic feet?

Q. I mean the length of it, from the point where the water was—where it backed up when you first knew it?

A. It covers the same acreage now—the same ground.

Q. The upper end is not filled up at all so as to prevent——

A. The water still covers it now but it is filled up with sand, sediment and mud from the muddy water.

Q. How often is that upper reservoir cleaned out?

A. I don't know of its having ever been cleaned out.

Q. To what extent is there vegetable growth or trees or stumps in that reservoir?

A. I think during the low water I noticed a number of stumps way up near the upper end somewhere.

149 Q. Are there any cat-tails or acquatic growth in the bottom?

A. A growth called cat-tails, I believe, grow around the upper end there, on the edges of the water—shallow water.

Q. Wasn't there quite a drought in the year 1895?

A. Yes, sir; I think there was.

Q. Do you remember the quantity and the quality of water supplied during the summer time of that year?

A. During the drought, I don't know exactly when it was, the upper reservoir was entirely empty along there with a stream of water running through it into the lower reservoir.

Q. What is the capacity of the lower reservoir?

A. Thirteen million gallons, about that.

Q. What was the quality of the water at that time?

A. I don't remember that the water got unfit for use—for domestic use.

Q. Do you remember looking at the upper reservoir at that time?

A. Yes, sir.

Q. Was there a quantity of dead fish in it?

A. No, sir; none at all.

Q. Were there fish in the reservoir at all?

A. Yes, sir.

Q. Were they living?

A. Yes, sir.

Q. How long did that drought continue?

A. I don't remember now, sir, exactly.

Q. Was it several weeks?

A. No, sir; longer than that.

Q. Were the fish living all the time without water?

A. Well, sir, I don't understand exactly how you have got

150 me into that. The reservoir, of course, fell gradually from the time the streams began to fall off until the water got to a depth where they could catch these fish. I caught some of them and eat some of them. Took them all out. They were carp and would weigh from two to five pounds apiece. We caught fish out of there twice, I believe. I don't know that it was at that particular time; but there was no dead fish.

Q. How many gallons of water were contained in the lower reservoir at that time?

A. Of course that is only an estimate. Only had a small quantity

of water in it. The upper end only had a stream running through it, I don't know exactly how much. They were using all the water they could get. Very low in the lower reservoir also.

Q. Was there as much as a week's supply in the lower reservoir?

A. We could not tell that. We were prepared to supplement the supply at any time.

Q. I want to know what was in the reservoir at that time: was there as much as a week's supply?

A. Had a supply at that stage for two weeks.

Q. I am speaking about the lowest stage, say about the first of December, 1895?

A. At the lowest stage? I could not tell how long it would have lasted if we hadn't had running——

Q. (Interrupting.) You say you could have supplemented the supply: How could you have done it?

151 A. By pumping water from another stream into the lower reservoir.

Q. Why wasn't that done?

A. Because it would have incurred considerable expense and it hadn't become necessary.

Q. What effect did this reduction in the head of water have on the pressure in the city?

A. About eight pounds I should estimate.

Q. The pressure was about eight pounds in the city at that time?

A. Eight pounds less than the usual pressure.

Q. What was the usual pressure, 35 pounds?

A. Average.

Q. You think the pressure was about 27 pounds?

A. That's the average. It was higher than that and perhaps a little lower at times. It varies according to the use of the water.

Q. Have you any record of the pressure during that time?

A. No, sir; I have not.

Q. Do you speak from specific recollection or general recollection?

A. General recollection.

Q. You have no record by which you can refresh your memory as to what the pressure was?

A. No, sir.

Q. Was there an official complaint brought to the attention of the water works company of the condition at that time: In order that you may know what I mean, I refer to the report of the special committe- composed of Brannon, Davis and Clegg?

A. If there was a complaint made it was made to the officials

152 of the company and not to myself.

Q. Do you know of the complaint?

A. I know of nothing except the fear that the supply would give out.

Q. You don't remember then specifically these complaints: Wasn't this complaint as to the unwholesomeness of the water as well as its deficiency?

A. I don't remember it.

Q. Would it refresh your recollection to read this report?

A. I don't think it is necessary. I can say that no doubt there were a number of people that did not consider the water good.

Q. I am speaking about official complaint?

A. The official complaint was not made to me. I know there were complaints. Always were. I simply can't remember any official complaint.

Q. That is because there are so many?

A. Yes, sir; been complaining ever since I have been with the company.

Q. How about '98: wasn't there a drought then: Wasn't '97 very dry?

A. I can't remember the years. I think though after '95 there was possibly two dry spells because the water got to be very low, not including the drought of 1902 when it went dry.

Q. What, if anything, was done to remedy the complaints that were made in '95 and the other complaints that were made, especially in '95?

A. Well, sir, I don't know of any special complaint you refer to. I know we always did everything in our power to remedy any-

153 thing that was called to our attention.

Q. You mean within your financial ability?

A. Yes, sir.

Q. Wasn't this drought of '95 a warning that you might expect similar conditions in the future: What was done to guard against those conditions, if anything?

A. Well, sir, I can't answer that for the simple reason that that part of the affairs of the company were not in my hands.

Q. No steps taken, so far as you know, Mr. Preer?

A. I know this; that they had had a survey made out there preparatory to building another reservoir; and increase the height of the upper dam. The supply of water had never failed and we had never had to curtail the use of the water by the private citizens or by the city; and it was generally felt——

Q. (Interrupting.) When was——

Mr. WIMBERLY: Let him finish.

WITNESS: And it was generally felt that we could meet the emergency when the time came.

Q. When was this they contemplated erecting and increasing the height of the dam and adding to the supply?

A. The survey, to the best of my recollection, was made by Mr. Yocum; and was made about the time I was first employed by the company. I remember seeing him in the office.

Q. 1892?

A. Must have been made in '91.

Q. My question was: were any steps taken subsequently, immediately following the drought of '95 to guard against a recurrence of these conditions?

154 The MASTER: Within your knowledge?

WITNESS: I don't know, no, sir.

Q. You were speaking of the drought of '97 or '98?

A. Not sure. I know there was another and perhaps two droughts after 1895.

Q. How much was the water reduced in quantity by that drought?

A. I can't say it was in '98; but the water in the upper reservoir—it became about empty again—the water was very low.

Q. Was that an extraordinary drought in '98 that you speak of: I will call it '98?

A. Yes, sir.

Q. It was an extraordinary drought in '95?

A. Yes, sir.

Q. And extraordinary again in 1902?

A. Yes, sir.

Q. So within eight years you have had three extraordinary droughts?

A. Yes, sir.

Q. I understand you to say that there were two between '95 and 1900?

A. Yes, sir; when one of the reservoirs became empty and the other one partially empty.

Q. From your practical observation and experience, what effect will the stagnation of the water have upon its purity and its wholesomeness?

A. I should not think stagnant water would be fit for use.

Q. During these periods of drought, wasn't the water in the lower reservoir stagnant?

A. We didn't consider it so. We were using at the rate of about one million gallons per day, taking all that came in: fresh water coming in all the time.

Q. You were reducing the head?

A. Yes, sir.

155 Q. What volume of water was coming in?

A. Of course it grew less each day of the drought; but to the best of my recollection there was fresh water coming in each day. No means of ascertaining how much except that it was less than we were using, because the water continued to fall some.

Q. How much were you using at that time?

A. About a million gallons, as near as I can tell.

Q. This fresh water that was coming into the lower reservoir, did that come through the upper reservoir?

A. Yes, sir.

Q. Wasn't it more or less contaminated by coming through the mud and sediment in the reservoir?

A. Well, sir, it was clear and seemed to be all right. Had no odor to it.

Q. But the upper reservoir did have sediment and mud in the bottom?

A. Yes, sir: in the bottom of the reservoir.

Q. In 1902——

The MASTER (Interrupting): Before you leave there: You say at that time: What particular time were you asking about?

Mr. WIMBISH: Just speaking of general conditions existing at those times.

The MASTER: I want to understand that: The witness said they were using about a million gallons a day?

Mr. WIMBISH: 1895, my question was.
Mr. WIMBERLY: At that time: He means '95.
WITNESS: And the drought he speaks of in '98 also.

156 Q. Your answer applies to all the droughts?
A. Yes, sir; except the last one when it went dry.

Mr. WIMBERLY: In 1902 it went dry?
WITNESS: Yes, sir.
The MASTER: He hadn't asked him about that.
WITNESS: No, sir.

Q. What were the conditions in 1902?

A. It simply went dry. The water became stagnant in July and unfit for use and we had to go to pumping—that is, the amount of water left there—we had to resort to the river.

Q. How long was that water furnished to the city, either as its entire supply or its partial supply after it became unfit for use?

A. The only way I can get at that, in my mind, is the work I did at that time preparatory to furnishing river water. I can't answer you positively but within a few days.

Q. When did you begin pumping river water?

A. I don't remember exactly. It was in July, I think 1902.

Q. Was it a week or a month after the water had become unfit for use?

A. It was not as much as a week—that is, I don't know when the water became unfit for use.

Q. I will say after the water became contaminated?

A. I don't know that either. We were nearly a day and a half erecting our pump to pump river water, after the city authorized the use of the water and condemned the water from the reservoir.

157 Q. You did not cease using that water until the city condemned it?

A. No, sir.

Q. Did you continue to use any part of the supply mixed with the river water?

A. No, sir; cut it off entirely.

Q. When did you begin using it again?

A. We used it for a part of the city the first of December, I believe, following that.

Q. It was not used from July to December?

A. Let's see: Let me be sure about that now. I believe it was November—I can't remember exactly.

Q. What was the quality of the river water that was used in the meantime: was there any attempt to filte- it or purify it?

A. No, sir.

Q. Did you pump it direct into the mains or through the standpipe?

A. Into both. Into the Rose Hill standpipe and the whole system of mains.

Q. Was the river water considered fit for use at that time?

A. I didn't consider it fit for use.

Q. How many baths did you take in the river water during that time?

A. I didn't take any.

Q. Did that water have an odor?

A. I did not detect any. I am satisfied I drank some of it several times around the pump when I was there at work.

Q. You got inoculated so you could not——

A. No, sir; except a muddy taste. I knew that other people drank it—that other people were drinking it.

Q. Did the reservoir water have an odor before its use was discontinued?

A. Yes, sir.

158 Q. Well, do you know whether the people of this city generally drank the river water during that period?

A. I do not, sir.

Q. Do you live in the city yourself?

A. No, sir.

Q. You don't use the water?

A. No, sir; except during the day. I had been drinking the water works water until the water became foul during that drought or rather when it went dry.

Q. Did you ever see any fish in the mains of the Columbus Water Works Company in this city?

A. No, sir.

Q. Do you know of any obstructions by way of vegetable or animal matter, a dead goose, anything of that kind, in them?

A. No, sir.

Q. What determines pressure?

A. The weight of a column of water and the height.

Q. Is that affected in any way by the volume of the water?

A. You mean in the volume of water used?

Q. Yes?

A. Yes, sir.

Q. In other words: will the pressure be greater through a 12 inch main than it would be through a four inch main?

A. It would depend upon the volume of water used through that pipe.

Q. Would it be affected by the rapidity of the current from circulation of the water—that affect pressure?

A. While you were using it, yes, sir.

Q. Why do you think a four inch main is too small?

Q. Well, sir, the square of a four inch main is 16 inches; and the square of a six is 36 inches. My practical experience is

159 that a four inch main will not, in opening a hydrant to flush them, throw water as far from the hydrant as a six inch main.

Q. Fire hydrants have 2½ inches opening.

A. Have two 2½ inch openings, one on each side of the hydrant.

Q. If the openings of the hydrant exceed, in the aggregate, the diameter of the four inch pipe——

A. Never use but one side of a hydrant.

Q. Why don't they?

A. If the fire is on one side of the hydrant they use that, or the other, as a matter of convenience. The two could not be used without shutting off, unless they were both connected at the same time.

Q. Don't you frequently use more than four streams at a fire?

A. Yes, sir.

Q. Where does the second stream come from?

A. From another hydrant.

Q. Why don't you take the second stream from a double hydrant?

A. I don't know. That's with the fire people.

Q. Isn't it because of lack of water pressure?

A. They can get a better supply by using from separate hydrants.

Q. If you had a 12 inch main would you use a double hydrant—I mean could you use a double hydrant?

A. O, yes, use it on any main.

Q. I mean effectively: Could you use it effectively on a large main?

A. Yes, sir; and smaller than that.

160 Q. You can't do it with a four inch main?

A. Yes, sir.

Q. Can you use a double hydrant effectively?

A. Yes, sir depends upon the pressure upon a four inch main.

Q. Take the pressure in this city on a four inch main?

Q. At present they could get two good streams through a seven eighths or one inch nozzle.

Q. Why is it a double hydrant is not used on these mains?

A. Double hydrants are on these mains; but as a matter of practise they are never used. Never noticed them using both sides of a hydrant.

Q. If they could get sufficient water pressure, why should they not?

A. If they went to a hydrant, they would connect there and then go to the other end of the block and connect to that hydrant.

Q. Why do you say it is too small?

A. Simply won't deliver the water that a larger pipe would.

Q. Then you can not get the same quantity of water?

A. I didn't say the same supply; they could get good streams.

Q. Do I understand you to say they could get sufficient streams?

A. That would depend upon the pressure.

Q. I am speaking of this system here?

A. They could get two streams—two effective streams on a hydrant on a four inch pipe under the pressure we have now.

The MASTER: What could you have done before the receiver was appointed?

A. Could not have used two streams effectively from one hydrant at a four inch pipe.

Q. Before the receiver was appointed?

A. No, sir.

161 Q. These dead ends are usually at the end of four inch mains in this city?

A. No, sir; mostly at the end of six inch mains.

Q. What effect does a dead end have on the pressure when water is drawn through the dead end?

A. Depends upon the distance of the hydrant from the connection with the other main. The effect generally is that it will produce one stream effectively. More than that cuts down the pressure.

Q. In other words: it may not affect the pressure or the volume of water for one stream?

A. No, sir.

Q. But it will for more than one stream?

A. Yes, sir.

Q. That be true of a six inch main as well as a four inch main?

A. Yes, sir.

Q. What effect would an opening above the point where you were first taking water have upon the pressure? Suppose you were to have a stream at a lower point and open a hydrant and take a stream from above that point, how does it affect the pressure at the lower point?

A. The pressure at the upper point would be a little more than at the furtherest point; but both would be reduced.

Q. Wouldn't it materially reduce the pressure?

A. On a dead end it would.

Q. Take a dead end: suppose you were to have two openings, that is, using water from two hydrants?

A. Yes, sir; it would reduce the pressure some.

Q. Suppose you have three?

A. Reduce it a little more.

Q. Doesn't it reduce it even in greater proportions?

162 A. Well, sir, I have not the knowledge to say about the proportion. I know it reduces it.

Q. What do you consider sufficient pressure for fires in a city like Columbus?

A. Sixty pounds.

The MASTER: Do you object to that testimony?

Mr. WIMBERLY: I am perfectly willing to let it go into the record. I don't care to close the mouth of the witness. I am willing to let it go into the record but we don't want to be understood as waiving our objection to the question. We simply ask your Honor to let the stenographer note that we do object; but we are willing for your Honor to suspend your ruling until later.

The MASTER: I will admit the question; but as to how far that answer is affected by this contract, when you gentlemen come to the contract, that is another question.

Q. How long have you been keeping a record of the pressure?

A. I believe since Major Greene took charge as Receiver.

Q. Only since then?

A. Yes, sir.

Q. What is the gravity pressure now—the average gravity pressure?

A. Now?

Q. From the Broad Street standpipe?

A. Well, sir, we pump all the water into the standpipe or into the mains, and the Broad Street standpipe simply acts as a main. The pressure below the Rose Hill district is 50 pounds.

Q. That the average pressure?

A. That's not all the time. It goes as high as 52 or 53 and as low as 48; and the Rose Hill district gauge at the engine house
163 shows from 75 to 85 pounds. At our pump shows 90. Of course the elevations are irregular, that is, up-hill and down hill all over Rose Hill. The minimum pressure on Rose Hill is 45 pounds at the stand pipe there.

Q. Where do you gauge the pressure. You say the average down town is 50, where do you take that gauge?

A. That's in our office on 12th Street.

Q. How much less would that pressure be down here below on Sixth Street?

A. If the elevation of the city was the same, it would not be any less.

Q. Wouldn't it be something less on account of the friction?

A. I expect when they are drawing water if they should open up a two inch pipe right at that opening, the pressure would be decreased.

Q. I mean this: Suppose you should tap a hydrant say on Sixth Street, any point, say through a four inch main, how would that pressure compare with the pressure at your office?

A. With a stream running and a gauge attached to the hydrant, it would show a difference in the pressure.

Q. Both ways?

A. The lower part of the city is some lower than our gauge and it would show more pressure. Would be two or three pounds difference in the amount it would be affected.

Q. Have you made any actual test of the pressure in the lower town excepting with the Rose Hill standpipe?

A. Not since the receiver has had charge.

Q. Did you make any before?

A. Yes, sir.

Q. What did you find by actual test?

164 A. We found that the pressure as low down as 6th Street, I believe, showed 2 or 3 pounds more than the pressure at the office on Broad Street. We were on Broad then above 12th, I believe.

Q. Are dead ends in a system desirable?

A. No, sir.

Q. You say in locating these additional mains it has been done under the direction of the fire chief, with his concurrence and consent, especially in the annex: were you directed to put in dead ends?

A. Well, sir, the location of the hydrants were determined upon and there was no way to avoid it except to run there and stop with the hydrant.

Q. Isn't it practicable to complete your circuit and not have dead ends?

A. It could be done but it was never required of us.

Q. Wouldn't it be better and wouldn't it give more water and better pressure if you did that?

A. Yes, sir; but the expense entailed in doing that—we would have to lay 5 or 6 miles of pipes with no revenue and go through a territory where there was no fire hydrants needed and no water-takers.

Q. It was a question of expense or economy?

A. Well, sir, to some extent.

(By the MASTER:)

Q. You said just now that there had been complaints ever since you had been with the company: From whom?

A. I said that I had noticed in the papers that they had complained of the pressure at a good many fires.

165 Q. You answered in answer to a question that Mr. Wimbish asked you that there had been complaints ever since you had been with the company; and I wanted to know who made those complaints, whether it was the authorities or who?

A. Various people. The Mayor himself has asked me once or twice about certain things that were complained of and I have investigated them. At one time there was some complaint of the water smelling. He spoke to me about it and I investigated it and I determined, in my opinion, that the standpipe needed cleaning out; and I cleaned it out. That seemed to remedy that particular complaint.

Q. Then do I understand by that statement of yours you mean complaints were from all sources, including the city?

A. Yes, sir.

Q. Including the city authorities?

A. Yes, sir; at times the Chief had complained to me *of* the pressure was not sufficient at certain fires, but never officially, except to talk to me about it. We would frequently talk together about the causes.

Q. Now I will ask you one other question that I thought of at the time: What did you say was the square of a six inch main? You said 32?

A. I should have said 36.

Q. You said thirty two?

A. Yes, sir.

Q. Then you want to correct that?

A. Yes, sir.

(The Court here took a recess until the next day.)

166 THURSDAY MORNING, *February* 11, 1904.

Court met pursuant to recess and the hearing was resumed.

Cross-examination of witness G. T. PREER was resumed by Mr. WIMBISH:

Q. How many miles of mains and pipes were there in 1895?

A. I think we claimed about 20 miles.

Q. What have you now?
A. Well, sir, about 25, I guess, or a little more perhaps.
Q. You are estimating, are you not, on that?
A. Yes, sir.

The MASTER: How much did you say now?
WITNESS: Twenty-five miles.

Q. Whether you are accurate in those figures or not, the present system is about one quarter larger than it was in '95—about one fifth larger?
A. Yes, sir.
Q. I wish you would glance at these figures and see if you can corroborate them as being correct "there is now laid and in use in the distribution system 24,326 feet of four inch pipe." How many feet of four inch pipe is there in the system now?
A. That's about correct, I believe.
Q. I will ask you this question: Are there of four inch pipe 24,326 feet, approximately?
A. Approximately that, yes, sir.
Q. And 47,427 feet of six inch pipe, 6,107 feet of 8 inch pipe, 3,662 feet of 10 inch pipe, or a total of 81,522 of distribution mains in the old city and 22,220 feet of six inch pipe laid in what is known as the Rose Hill Annex?
167 A. That's approximately correct in the old city.
Q. And then 6,107 feet of eight inch pipe?
A. Yes, sir.
Q. And 3,662 feet of 10 inch pipe?
A. Yes, sir; I think that's about correct.
Q. Making a total of 81,522 of distribution mains in the old city: How much in the Annex of 6 inch pipe?
A. Well, sir, I think about 22,000 is about correct.
Q. 22,220 feet?
A. That is not up to date. There is more than that now.
Q. These figures make a total of 19.64 miles?
A. There is some 12 inch pipe in the distribution system.
Q. That does not include the 12 inch main to the city?
A. No, sir. Some 12 inch in the distribution system. A small quantity.
Q. How much 12 inch main is there in the distribution system?
A. At present there is only from the pumping station to the Broad Street standpipe—about 3500 feet I should say.
Q. About 3500 feet?
A. Yes, sir.
Q. How many water-takers were there in '95?
A. To the best of my recollection—it can be shown by our books exactly, but I think that there were about 1200 or 1300 contracts. These were not all in use.
Q. How many were there in 1902?
A. About 1600.
Q. How much greater was the consumption of water in 1902 than in 1895?

A. Well, sir, we had placed meters on a number of the manufacturing concerns and cut down the use of the water by that means. I think there was as much water used in '95 as there is now.

Q. The city in '95 was at its lowest point in prosperity
68 and population in the last 15 years, wasn't it?

A. Yes, sir; I think so. I think that's about the time. I don't remember exactly; but I know at one time we had very dull times here.

Q. The years following '93, wasn't it?

A. I think so, yes, sir.

Q. There has been great improvement since then and a number of houses built?

A. Yes, sir.

Q. And new industries in process?

A. Yes, sir.

Q. And new water takers?

A. Yes, sir.

Q. In 1902 you supplied a good many small industries with water or for the use of water meters that you don't supply now—electricity has taken the place of that?

A. We supply two elevators, I believe now.

Q. You supplied the same in 1902?

A. In 1902 we supplied only one elevator.

Q. Did you not supply water for other small manufacturing uses?

A. O-, yes, sir.

Q. More than you do now or less?

A. Well, more new business than we did at that time.

Q. Can you make a statement from the books showing the number of water-takers in 1895, '98 and 1902?

A. Yes, sir.

Q. Please do so and hand it to the reporter?

A. I think we have those water rent books. If we have them they will show it.

Q. I will ask you to make up a statement after you leave the stand and hand it to the stenographer?

A. Yes, sir.

Q. Can you show the amount of water used in these years?
169 I mean the average?

A. Only by estimate. Had no means of determining that at that time.

Q. Since '95 the Rose Hill Annex system has been put in?

A. Yes, sir.

Q. Hasn't that increased the consumption of water?

A. Very little.

Q. Were any efforts made for filtration or purification of the water prior to the receivership?

A. I think there was some correspondence once or twice with filter people in regard to a filter—filtering the water. Only effort I know of. As to purification, they took the ordinary precautions at the reservoir to keep the water pure.

Q. What were those precautions?

A. It was to keep down vegetable growth around the edges of the reservoir and to employ men there to look after the streams and to keep any dead animals, anything like that, off the nearby water shed there.

Q. Those were the ordinary efforts to prevent contamination?

A. Yes, sir.

Q. They were not efforts to purify the water?

A. They were efforts to prevent it from becoming impure.

Q. Were any efforts taken to keep out detritus washings from the water shed into the upper reservoir?

A. There was when I was employed by the company as collector Mr. Tuggle, then Superintendent, built a sand-trap on one of the creeks, is the only effort I can recall.

170 Q. What is a sand trap?

A. It is an arrangement to catch sand or mud to prevent it from washing into the reservoir.

Q. Was that maintained—kept up?

A. No, sir; it washed away.

Q. Did the lower reservoir get any water except from the upper reservoir?

A. There seemed to be 2 or 3 small springs in the lower reservoir.

Q. Why do you think there were springs in the lower reservoir?

A. Because I saw them when we were cleaning out the reservoir.

Q. What was the volume of water, large or small streams?

A. Very small.

Q. Might not that have been seapings from the upper reservoir?

A. I think not; because they were in the lower end of the lower reservoir.

Q. I believe you stated on yesterday that they never connected the Stewart Branch with the system?

A. No, sir.

Q. They have never raised the dam?

A. No, sir.

Q. They have never taken any steps to increase the supply?

A. Yes, in 1901, I believe, or it may have been the early part of 1902—it was the early part of 1902, we took steps to increase the supply and increase the pressure.

Q. What was done—what was accomplished?

A. A representative of the company went on North and arranged to get the money.

Q. I don't mean anything that you might have contemplated, I mean anything that was done?

171 A. There was no increase made.

Q. Was anything actually done—I don't mean plans?

A. Yes, a representative went on to get the money. We did that.

Q. Did he get it?

A. Had about completed the arrangements when an election was ordered by the city which cut us off.

Q. You never did anything?

A. No, sir; we could not get the money after that.

Q. Whatever may have been the reason there was nothing done ctually?

A. No, sir.

Q. When was the election ordered, in 1902?

A. I think along about June. I don't remember the exact date.

Q. Wasn't it the latter part of September?

A. I am not sure when it was. I know it was along about that ime.

Q. The ordering of the election was the thing that deprived the ompany of the power to get the money?

A. Yes, sir.

Q. It would have gotten it except for that?

A. Yes, sir.

Q. So if it was in September when the election was ordered, the upply—it was after the supply had failed?

A. Yes, sir.

Q. And after these conditions, which were complained of, had been brought about?

A. Yes, sir.

Q. Hasn't the company always claimed that they had plenty of water but the trouble was that the supply main was insufficient in size?

A. Up to the time the reservoir failed we claimed that.

Q. What was the trouble with the supply main?

A. Well, sir: there was no particular trouble, except that
172 the increase in the use of water at this end decreased the pressure afforded by that main.

Q. It was deemed then to be too small?

A. Not at that time, no, sir.

Q. How is it at this time?

A. Well, sir, in 1902 it became very evident that it was too small to supply the city with pressure and water sufficient.

Q. Is the water in the mains and pipes of the city in constant circulation?

A. Well, sir, except at dead ends; and that depends upon the amount of water being used and where it is used.

Q. What produces circulation?

A. Use of water.

Q. Opening of the pipes or faucets?

A. Yes, sir.

Q. Is there much water used between mid-night and five o'clock?

A. Well, from 12 to 3 there is very little water used.

Q. Is there enough water used during those hours to make a perceptible circulation throughout the system?

A. Well, the use of water does not stop altogether. How much it affects the circulation I could not say.

Q. So the current when still, any organic matter, mud or impurities that may be in the water may be precipitated or deposited in the bottom?

A. Yes, in the bottom of the pipe.

Q. If the water running through the pipes was foul and impure, and the current would be so when still, and this deposit or sediment

should take place, wouldn't that affect the purity of the water afterwards flowing through these pipes?

A. Yes, unless it was drawn out.

Q. Is there any method of cleaning under-ground pipes?

173 A. Yes, sir.

Q. What is the method?

A. Open up the fire hydrants.

Q. Flushing them?

A. Yes, sir.

Q. How often do you flush the system as a whole?

A. Well, sir, we flush all the dead ends regularly. We have a man employed for three nights in a week; and each dead end is flushed one night in every week.

Q. How about the other pipes, how often are they flushed?

A. Well, sir, only occasionally.

Q. Once a month?

A. No, sir; not so much as the others.

Q. Three or four times a year?

A. Well, sir, I don't think we have had any occasion to flush those often—that often until we wanted to clean the mains of the sediment in them after we started to filtering the water. Then every hydrant in the City of Columbus was opened and flushed thoroughly.

Q. Flushing only carries away such matter as may be detached or easily soluble, isn't that true?

A. Yes, sir; carries away the sediment in the pipe.

Q. Where was the submerged main located with reference to the old 14th Street bridge?

A. On the Alabama side it was laid just North of the First pier and laid out a little further and then straight across to the Georgia side.

Q. How far North of the first pier that you think broke the submerged main in its fall?

A. Well, sir, about 15 feet, to the best of my recollection or estimate.

Q. Well, was this submerged main on the bottom of the river?

A. In places it laid on the bottom; but in that particular place there was a deep slough in the river and the pipe swings somewhat.

174 Q. There was a very rapid rise on that occasion, was there not—a very strong current?

A. Yes, sir.

Q. And the falling of the pier, under those circumstances would have caused it to fall South, wouldn't it?

A. I don't know that it would have. I think the pier simply crumbled and fell down.

Q. What was the pier constructed of?

A. It seemed to me that the upper part of it was loose rock, might have been cemented, not sure.

Q. If the current was strong enough to sweep the bridge away, even if it crumbled, wouldn't it have swept the component parts of the pier down stream?

A. The rock may have been sufficient to have sunk where it crumbled.

Q. How deep was the water at this place, I mean from the surface to the pipe?

A. I should judge at that time it might have been as much as 20 feet.

Q. Do you think it reasonable that there could be a falling of a pier of mortar and stone and brick, or what ever it might be, falling 20 feet through water on a main up stream with sufficient force to break it?

A. Well, sir, the meaning of my answer in regard to the breaking of the main, was not that it was crushed or broken by any material that fell. The joints of the pipe near the bank was made of what we call a sleeve, two ends of the pipe, two plain ends of pipe joined together and a sleeve over that; and my opinion was when this pier fell, it created a commotion in the water and that
175 caused this pipe to sag and pull apart in that sleeve. That is merely a supposition of mine. That's where it pulled apart nevertheless and I found it there and repaired it.

Q. Do you think the falling of that pier would have produced any appreciable effect in the river with as strong current as was running at that time?

A. I say it is simply my opinion. Nobody else in the world might have that opinion.

Q. I don't doubt the honesty of your opinion at all; but I want to find out your opinion: Isn't it more probable that the current of water broke the main?

A. Well, sir, I think it would have been broken before if it had been the current of water. It may have been simply being in use, coupled with the current of water, may have caused the joint to pull apart.

Q. Then I misunderstood you when I understood you to say the falling of the pier caused it to break?

A. I never intended to convey the idea that it crushed the pipe, anything like that.

Q. During 1902, that is, the Summer when the reservoir failed, did the wells in this city fail?

A. I think a number of them did all around the city.

Q. Didn't the citizens largely resort to the use of well water—restore their old wells?

A. Yes, and spring water hauled in and sold.

Q. Did the springs in this neighborhood fail?

A. No, sir.

Q. Did the East Highlands Branch fail?

A. Not altogether supplied by springs east of the city, Mr. Garrard's and Mrs. Hurt's. I don't know that they ever failed.

Q. If the ground had been dry for a depth of 15 feet,
176 would these wells and springs have failed?

A. Some wells and springs no doubt did.

Q. Wouldn't these, in your opinion, if the ground had been dry for a depth of 15 feet, have failed?

A. Evidently wasn't dry around these springs.

Q. If the drought was so great, why was it the water in the river was so muddy?

A. Well, sir, the river was very low; but they seemed to have had rain up above somewhere; and the washings from the hills into the river above here muddied it at times. At times it was clear.

Q. Wasn't it almost continuously muddy during these three months?

A. Well, no, sir. I think you may say half of the time it was very muddy.

Q. And the other half not so muddy?

A. Yes, sir.

Q. The drought then was local to Columbus to a large extent?

A. Well, sir, I think so.

Q. Have you a record of the pressure for July, August and September, 1902?

A. No, sir.

Q. You were not keeping records at that time?

A. Were not at that time.

Q. From what part of the pipe was that segment taken? (Referring to specimen of pipe identified by witness W. S. Greene.)

A. From the side.

Q. I believe you said you didn't take it yourself?

A. No, sir.

Q. Did you ever cut these pipes?

A. I have been present, yes, sir, when they were cut.

Q. Did you ever detect any odor?

177 A. No, sir; I don't recall that I have.

Q. Did you ever take up any pipe?

A. Yes, sir; I have taken up some 4 inch pipe.

Q. Did you detect any foul odor there?

A. No, sir; I don't remember that I did.

Q. Do you remember when some pipe was taken up on 4th Avenue between 14th and 15th Streets, under a grating in the street, were you present at that time? Do you recall that fact, Mr. Preer?

A. I was not present if the time you refer to was last summer. I don't know what time you refer to.

Q. You were not present at that time?

A. No, sir; I was employed at the filter plant at that time.

Q. In your testimony yesterday you spoke of the average pressure during a series of years: How did you arrive at the average pressure?

A. Only from my general recollection of how the pressure was.

Q. I understand: How did you arrive at the average?

A. Well, sir, mostly an estimate in this way: From six o'clock in the day, the pressure would rise until six o'clock in the morning as high—I have seen it as high as 48 pounds, gravity; and during the day it would fall gradually as low as 25. About the middle of the day generally about half that amount. Decrease from six o'clock in the morning until six in the evening.

Q. Where did you see these records; and how often did you consult them?

A. They are up in our office.

Q. Do you keep the records?

A. We had a recording gauge. Have a gauge showing
178 the amount of pressure to the square inch at all times.

Q. That's your general recollection by looking at the gauge?

A. From this gauge, yes, sir.

Q. What is the theoretic pressure that can be obtained from the Rose Hill standpipe when it is full—I mean in the lower city?

A. Take 200 feet elevation, that would give you 200 times .43 of a pound, or 86 pounds, I believe.

Q. Would it be possible to develop 120 pounds pressure from that standpipe?

A. Yes, sir; with the present conditions by pumping water into the Rose Hill standpipe.

Q. How can that increase the pressure?

A. The water to the Rose Hill standpipe is pumped through small pipes; and the back-pressure is what causes the increase below.

Q. The back-pressure: will you explain a little more fully: I don't understand just what that means?

A. It is simply this: the pump forces the water out faster than it can be relieved through these pipes and creates a pressure this side of the Rose Hill standpipe on the pipes leading to Rose Hill—friction in the pipes.

Q. Is the water ever pumped directly into the mains of the city in order to get pressure?

A. Never has been, except on one occasion when we were cleaning out the Rose Hill standpipe, we pumped into the mains direct for the whole city at that time.

Q. Isn't it true, in the summer of 1902, that the pressure was insufficient to raise the water to the second story of buildings in this city?

179 A. The domestic pressure below the Rose Hill district at times there were complaints.

Q. Did you investigate the complaint made by Mr. Garrett, if he made any complaint?

A. I don't remember that particularly.

Q. Do you know how it was at the Rankin House?

A. No, sir. Where was that?

Q. The Rankin House?

A. There was complaint at that plac- several times.

Q. Is it not true that they could not obtain water on the second floor for baths?

A. They could obtain water but perhaps not as fast as they wanted it.

Q. Could they obtain it at all on the third floor?

A. That depends upon the height of the third floor. I don't know exactly. The pressure got as low as 18 or 20 pounds and that ought to carry the water twice that heigh-.

Q. That's theoretic; but not enough to carry itself through pipes or hose or nozzles?

A. More so through pipes where it is confined, will flow up and seek its level.

Q. There is a loss from that, isn't there?

A. When you are drawing water the effect is it is weakened and becomes very slow.

Q. That's the time you want pressure, when you are drawing water?

A. Yes, sir.

Q. How was*n't* it that the break of 2½ inches in the Hill Sprinkler works could materially reduce the pressure?

A. In addition to the amount of water already running to waste from bursted pipes and other consumers allowing their pipes
180 to run to keep from freezing, affected the pressure considerably.

Q. Could 2½ inch pipe, waste from that pipe, in addition to the ordinary consumption have reduced the pressure?

A. Not so much.

Q. How much would it have reduced it under normal conditions—appreciably? Would you have been able to have detected it from your gauge?

A. Yes, sir; we would have.

Q. How much did it reduce it on the occasion you speak of?

A. During that freeze? I don't remember exactly how low the pressure went; but it went down, to the best of my recollection, to about 15 pounds.

Q. What's the size of an opening to a hydrant, 2½ inches?

A. Yes, sir.

Q. When the Southern Railway was filling the tank of their engine, using the hydrant for that purpose, they used a 2½ inch stream?

A. Their hose was attached to the hydrant. I don't know whether there was a nozzle on the end of the hose or not. I don't think there was.

Q. Could not have been greater than 2½ inches?

A. No, sir.

Q. How much did that reduce the pressure?

A. From 60 to 41 pounds.

Q. 19 pounds?

A. That's as near as I can remember. The gauge run along as high as 70, between 60 and 70.

Q. Then if you have a fire of any magnitude and there are several streams to obtain to play on the fire, you would very greatly reduce your pressure, wouldn't you?

A. Yes, sir.

181 Q. Could three streams reduce it as much as thirty pounds?

A. No, sir*t;* it should not.

Q. If a 2½ inch opening in one case would reduce it 15 pounds and in another case 19 pounds, wouldn't three openings reduce it as much as 10 pounds each?

A. I think not, sir; because nozzles on a fire hose are generally one inch only. 2½ inch stream would be enough to create a good many one inch streams.

Q. Now this Swift fire: I understand you to say the Rose Hill water had been turned on by the fire department before you received notice of the fire?

A. Yes, sir.

Q. And notwithstanding that the pressure was not sufficient and that you notified the powerhouse?

A. I don't remember saying the pressure was not sufficient. The pressure was not as much as it would have been if the pump had been started.

Q. Was it sufficient?

A. To the best of my recollection it was about 40 pounds. May have been a few pounds less or a few pounds more. I happened to be in the office at that particular time.

Q. If it was 40 pounds and they had the use of the Rose Hill water, why was it so low?

A. Well, sir, there is not but one way to explain it, as I see, and that is, the water from Rose Hill could not flow very fast from Rose Hill, fast enough to supply the general uses of water and keep up the head of pressure from the height of the water in the Rose Hill standpipe.

182 Q. That due to the size of the pipes or to the lack of sufficient water?

A. To the size of the pipes.

Q. Those pipes are new pipes, ain't they, from Rose Hill down?

A. Yes, sir.

Q. Has the company been putting in reservoir pipes that are too small?

A. Well, sir, the agreement was for eight inch; and I think they compromised on two six inch pipes.

Q. Take the iron works fire, were you present there?

A. I passed from the pumping station to the fire several times, staid a few minutes and went back to the pumping station.

Q. How many hydrants were used or could have been used at that fire and where were they located: Do you need the map?

A. No, sir; I can tell you. There was a hydrant at 9th street and Front, Dillingham and Front and 10th and Front and one hydrant between the foundry department and the machine shops of the Iron Works, down near Short Street.

Q. Four hydrants available?

A. Three; because they could not get to the hydrant under the trestle on account of the fire.

Q. Any two of those hydrants on the same main?

A. Well, sir, all three.

Q. All three?

A. Yes, sir.

Q. Then the opening of the three hydrants reduced the pressure, didn't it?

A. Yes, sir.

Q. What was the size of the mains supplying those hydrants?

A. Six inch.

Q. Do you know or can you arrive at what was the actual
183 pressure after these hydrants were opened and the streams were being played on the fire?

A. I looked at our gauge in our office three or four times during the night; and to the best of my recollection it showed 33 pounds,—stood along between 33 and 35.

Q. Is a pressure of 33 pounds through a six inch main sufficient to cope with a fire of that magnitude?

A. With steamers to increase the pressure I think it would be sufficient.

Q. How much water can a six inch main deliver per second or minute?

A. It depends upon how close it may be to a larger main.

Q. Take this main?

A. I don't believe that I would be competent to figure that out exactly.

Q. I will ask you from your practical experience, if you really think that main would supply sufficient water to cope with that fire, three hydrants all being located on the same main?

A. I am not sure either that they used these three. They may have used one on Broad Street. It would have been better to have gotten the water from another main, if possible.

Q. If the average pressure was 25 pounds before you put in the pumping station——

The MASTER (interrupting): You started to answer the question, what was it?

WITNESS: They may have used the hydrant on 8th Street and Front.

Q. Wouldn't that be greatly reduced in periods of drought or low water?

A. I stated, I believe, about 8 pounds, when the lower reservoir was as low as it was during the drought.

184 Q. Was the pressure furnished from the lower reservoir during the drought of '95?

A. Yes, sir.

Q. Was that as much as 20 pounds?

A. More than 20 pounds is my recollection.

Q. Well, that's your recollection?

A. Yes, sir.

Q. Always more than 20 pounds?

A. Not always. I don't say that. I believe that it was a good deal more than that at times; and it may have gotten below that on some occasions. The occasions I refer to is when they flush the sewers at night, open up a 2½ inch stream in to the sewers to flush them.

Q. Do you re-call whether there was much of a drought in May and June of 1898?

A. My memory as to dates is mighty bad. I know that there was

a drought that followed the drought of '95. In fact, nearly always dry in the early Fall.

Q. Wasn't the pressure of May 3, 1898, 20 pounds?

A. I don't remember.

Q. May 4, 20 pounds?

A. I don't remember.

Q. And May 5, ten pounds?

A. I don't remember.

Q. Have you any recollection as to the particular dates or months?

A. Not as to particular dates. I have already stated that it did go lower than 20 pounds on certain occasions but how low I can't remember exactly.

Q. Do you remember during the month of May, 1898, it ever went above 28 pounds?

A. No, sir; I don't remember.

Q. Do you remember that on at least eight occasions it went below 20 pounds or less?

A. I don't remember it. I think it could have—might
185 have been.

Q. And that on two occasions it was respectively ten and eleven pounds?

A. I don't remember that.

The MASTER: He has stated he could not specify any dates; but that there were times when he knew the pressure went below 20.

Mr. WIMBISH: Yes, sir; but I want to see if I can't refresh his memory.

WITNESS: I believe the records show what the pressures actually were.

Q. What is that?

A. I believe the records show, if you had the gauge records, what the pressure actually was.

Q. I will ask you: do you remember whether on August 19, 1898, that the pressure failed almost completely, only 2½ pounds shown?

A. I don't remember. If it did must have been some unusual cause for it.

Q. Is your memory clearer as to 1900 and 1901, is your memory clearer as to that year, from May through to August and September, 1901?

A. Well, sir, I think in a general way it ought to be, more recent date.

Q. That was after the Rose Hill Standpipe?

A. Yes, sir.

Q. Was the pressure at any time, from May 30 to September 4, less than 20 pounds?

A. Twenty pounds or less?

The MASTER: That 1900 or 1901?

Mr. WIMBUSH: 1901: As low as 20 pounds I will put it?

A. What portion of the city?

Q. This gauge where it was shown at No. 5 engine house?

A. Yes, sir; I believe it was; but I don't remember ex-
186 actly. I believe at night, when we pumping into the Rose Hill standpipe it did go as low as 15 pounds. Had no record gauge and had no way to ascertain that.

Q. You know whether from May 30 to September 4, 1901, the pressure was below 30 more than 50 times?

A. Well, I expect it was below that once every day when we were pumping into the Rose Hill standpipe at night.

Q. See if that is not the date of the original record, April 10, 1902, the date of the Iron Works fire? (Handing witness records.)

Mr. WIMBERLY: These records prove themselves. I can't see the practical utility of showing the witness records and asking him if these are the records. * * *

Q. I will ask you if this records shows the pressure during that fire was 20 pounds?

A. During the time the water was on from Rose Hill I don't think it would have showed it went as low as that. When the water was cut off from Rose Hill the next morning it might have gone down lower than 20, when they only had gravity pressure.

Q. Do you know what the pressure was the day following the fire?

A. It was very low from gravity. I don't know at what time the Rose Hill pressure and the pumps were shut off.

Q. When did you begin to use river water?

A. Well, sir, we pumped river water during the month of March while we were making the connection from the reservoir around over the railroad bridge.

The MASTER: Give the year: 1902?

WITNESS: 1902. I don't remember the day we started.

187 Q. How much river water have you used since you began using the filter?

A. I could not tell exactly. During last summer we used considerable river water.

Q. Did it go into the mains?

A. It went through the filter first.

Q. It didn't go back as wash water?

A. No, sir; mixed with the water works water that was filtered and pumped into the city mains.

Q. What proportion would you say for July, August and September?

A. We have a record to show exactly. I think it would have amounted to 100,000 gallons.

Q. That would be about 1/100th?

A. Yes, sir; about that.

Q. I want you to give me a statement from those records and hand it to the reporter?

A. Yes, sir; we can do it.

Q. I wish you would for those three months and follow it up with your affidavit?

A. Yes, sir; can take the bill from the power company and show the number of gallons they pumped.

Q. About the middle of August, 1903, were you not using about half river water at that time?

A. I don't think we ever used as much as half river water in one day.

Q. What would be the largest proportion you ever used?

A. We did use river water altogether on several occasions when we were making connections—working on the pipe.

Q. I don't mean that?

A. The river water, to the best of my recollection, just about offset the water we used in washing. About that time we washed the filters about 16 times in 24 hours or about 160,000 gallons.

Q. You think that's the largest amount you have used?

A. In one day—we may have used as much as 300,000
188 gallons in one day.

Q. If the water is pure after being filtered, if allowed to stand in a pitcher over night or in a bathtub, would there be any sediment or deposit, if the vessel is clean?

A. Well, sir, it does not seem that there should ordinarily. I can't tell.

Q. Have you observed those conditions as to this water that is being furnished the city?

A. Never have any sediment water in our clear water basin; and it has not been washed out in two months.

Q. If there is none in the basin and there is sediment in a clean bathtub after standing, the water must have accumulated that matter in transit from the basin to the tub, must it not?

A. Well, sir, it could do it. If the water stood in our basin, not flow in and not flow out, it might settle. Never can tell.

Q. If it is not in the water when it leaves the basin, it is accumulated while in transit?

A. One or the other I don't know which.

Redirect examination.

(By Mr. WIMBERLY:)

Q. Speaking of sediment: do you know that there is any sediment in the bathtubs?

A. I do not, sir.

Q. What sort of connections do they use in the private residences of the city, are they cast iron or wrought iron?

A. Wrought iron, some galvanized and some plain, black pipe, I suppose.

Q. As to rusting, how would the latter pipe in a person's private residence compare with the large mains of the system?

189 A. My experience has been that three quarters of an inch service pipe will choke up with rust in about 12 years.

Q. Do you know whether there are service pipe here that are older than 12 years?

A. Yes, sir; I think there are a number that are older than 12 years.

Q. Where they choke up with rust, are they liable to cause sediment that the water is not responsible for?

A. Yes, sir; especially where they made an increase in the pressure because it broke off from the pipe.

Q. Since there has been filtration have you had an occasion to take up any pipes?

A. Yes, sir.

Q. What's the condition of those pipes as to mud or impurities?

A. The pipes I cut into seemed to be entirely free of any sediment, especially noticeable since we have had filtered water to flush the mains out.

Q. Entirely free of sediment?

A. Yes, sir.

Q. Mr. Wimbish asked you about record of pressure on the day or about the date of the Columbus Iron Works fire, was that low pressure during the fire or after the fire was over?

A. If it was ever lower than 33 pounds, as I said, it must have been the morning after the fire, when they were still playing water on this old jute bagging in the warehouse.

Q. How long were they playing water altogether from the time the fire broke out?

A. To the best of my recollection, they used water at that warehouse—flooded the warehouse with water there all day—the next day and possibly longer than that. I don't remember exactly how long.

190 Q. Now after that fire was over, did you make good the loss: How did you make good the loss of pressure, by starting the pumps again?

A. Well, sir, we pumped the water up into the Rose Hill stand pipe.

Q. The effect of making good all the loss that had been used, was that to cause faster pumping than you ordinarily do?

A. It would be. I think upon that occasion we were pumping into the Rose Hill standpipe and the whole city during the fire. Don't remember whether we continued to pump into the Rose Hill standpipe after they cut off the Rose Hill pressure or not. I can't remember that.

Q. After they cut off the Rose Hill pressure, the extraordinary quantity that was being pumped to make good what had been used up during the fire, what effect would that have upon what you call the domestic pressure—the lower down town pressure with the Rose Hill cut off?

A. It would reduce it considerably.

Q. In other words: the more rapid use of the pumps to make good the large quantity of water used up during that fire would be to suck the water out of the pipe and diminish the down town pressure?

A. Yes, sir.

Q. That down town pressure that was thus temporarily reduced, after this fire was over and by the working of the pumps, would that affect the fire protection down town or could you have turned it on from Rose Hill again?

A. We could have turned it on from Rose Hill at any time.

Q. You had it in readiness to supply if it had been needed?

A. Yes, sir.

Q. Was the town, by reason of the low domestic pressure that fol-

lowed immediately after the fire, left without fire protection
191 in any way?

A. No, sir.

Q. How long would it have taken to have turned on the pressure again from Rose Hill, if it had been needed for fire protection?

A. Not longer than the usual time, two or three minutes.

Q. That is a good deal quicker than they can get to a fire, isn't it?

A. Yes, sir; depends upon the distance.

Q. I mean the water being turned on, you can get the water to the fire within the time you speak of, a couple of minutes, such a matter, the time it takes to get the water from Rose Hill, does that delay them in the actual use of the water at a fire after they get there?

A. No, sir.

Q. How long does it take them to get to a fire after an alarm is turned in?

A. They get there mighty quick, I don't know how long.

Q. I mean approximately, is it more than 2 or 3 minutes, even when they do their very best?

A. Well, it depends upon the distance of the fire from the engine house. They make about as rapid speed as possible.

Q. They were asking you about the pressure during the season of 1901, you spoke of the domestic pressure, did you not—the down town pressure?

A. Yes, sir.

Q. At that time, in 1901, what was the fire protection—what was the down town pressure?

A. No, sir; the pressure to be used from Rose Hill.

Q. You had your Rose Hill pressure during all that time?

A. I think in 1901 we were using that.

Q. After the works were accepted by the city you had that
192 Rose Hill Pressure at all times to fall back on?

A. Yes, sir; and before it was officially accepted.

Q. He asked you as to one or two or three or may — 6 or 8 times in '98, as to the pressure getting low, were those low pressure times lasting or just for a short time?

A. Well, sir, to the best of my recollection for 3 or 4 hours out of the 24.

Q. During that particular drought?

A. Yes, sir.

Q. During those times of drought, you had your pumping system to still keep the standpipe full?

A. Yes, sir; we pumped it full once a day.

Q. Once every day?

A. Yes, sir.

Q. That would give you standpipe pressure would it even though your water over there got low?

A. Yes, sir.

Q. When did you say you got your pumping system completed to replace the gravity pressure, about when?

A. It was completed, I think, in 1902—it was completed and accepted.

Q. 1900?

A. Yes, sir.

Q. You said 1902: I don't believe there is any dispute as to the date: You mean 1902 they accepted it?

A. I think it was completed, test made and accepted, I don't remember.

Q. Wasn't 1902 the year the bridge washed away?

A. Yes, sir. I was confused as to dates. I can't remember dates.

Q. He asked you abo-t low pressure on one or two occasions in '95: I believe you said if it ever got below 20 pounds that it was when the city was flushing sewers: How were the sewers
193 flushed?

A. They attach hose to fire hydrants and empty it through the hose into the sewers.

Q. Any nozzle on those hose at all?

A. No, sir—not sure. The only times I have ever noticed the hose there was no nozzle on it.

Q. How long would they allow those streams to run to flush the sewers?

A. In dry weather the flushing was more necessary than any other time. I should judge 2 or 3 hours each night.

Q. How many streams?

A. They usually used two streams at one time. Never more than that.

Q. That would temporarily cause a drop in the pressure, would it?

A. Yes, sir.

The MASTER: Ask him what effect that would have upon the pressure?

WITNESS: It lowered the pressure.

Q. Do you know anything about what right the city had to flush sewers?

A. I am not familiar with the contract, that is, the details of it.

Q. Was the water works company notified when the sewers were flushed so they could regulate the length of time, or did the city control that?

A. We were never notified—at least I was not; and I don't remember any one else was connected with the company.

Q. Did this flushing of sewers ever take place while a fire was going on that you know of?

A. Well, sir; I am not sure. I think though that the Sanitary Inspector if he had heard a fire alarm would have cut it off.

Q. Whether they actually did it or not, do you know?
194 A. I don't know, sir.

Q. When the flushing of sewers was done during these dry spells that you speak of, did the water pressure drop low?

A. Yes, sir; and at all other times also.

Q. They asked you about the number of hydrants used at the Columbus Iron Works fire: You say they could have gotten the water from how many different pipes within accessible distance of the fire?

A. The nearest main was on Front Street. There were three hydrants or four including the one at 8th Street.

Q. Now let's look at the map. That fire reached out as far as what street?

A. Below 9th and up as high as Dillingham and on Broad and Dillingham.

Q. It reached as far as Bay Street?

A. Yes, sir.

Q. How many hydrants on Bay Street?

A. None at that time. There was one near Bay Street there under the trestle; but they could not get to it on account of the fire.

Q. What other hydrants was it that you said they might have used?

A. On Broad Street, Broad and Dillingham; and Front and 8th.

Q. Front and 8th?

A. Yes, sir.

Q. They were on different mains?

A. On Front and 8th the hydrant there is on the same main as the other hydrants north of that point.

Q. The Broad Street main is separate?

A. Yes, sir.

Q. What is the size of the Broad Street main at that place?

A. Eight inches.

Q. Do you know what steamers they had at that fire?

A. I saw three steamers at the fire, I believe.

195 Q. They all working?

A. The old steamer wasn't at the time I saw it.

Q. So when you said with the steamers the supply would have been sufficient, they actually had at work how many steamers?

A. I saw two steamers actually at work.

Q. You don't know why the other one failed to work?

A. No, sir.

Q. How many steamers did the city own at that time?

A. To the best of my knowledge three.

Q. Had only two at work at that time?

A. At the time I saw them.

Q. You spoke about a change in the plans by which in place of an eight inch main as originally contemplated, from Rose Hill to connect the lower part of the city, they substituted, by agreement with the city, two six inch mains?

A. Yes, sir.

Q. How would the quantity of water delivered by two six inch mains compare with that delivered by one eight inch main?

A. Well, sir, according to the rule of calculating, I don't believe two sixes would deliver quite as much.

Q. Practically about the same?

A. Yes, sir.

Q. You compare them by the squares?

A. Yes, sir.

Q. The square of six is?

A. Thirty six.

Q. And twice that?

A. Would be 72.

Q. And one eight inch would be what?

A. 64.

Q. Why do you say two six inches would not compare with one eight inch?

196 A. The two sixes would just about deliver as much water as one eight. The friction being greater in the two would be overcome by the difference in the squares.

Q. The defendant's counsel asked you about a test at the time of the use of water by an engine thereby reducing the pressure from 60 to 41 pounds: At the time that engine was sucking water was the fire stream also playing—the test stream, I mean—the Sixth Avenue test?

A. Yes, sir. I was simply trying to be sure about it. To the best of my recollection they were using two streams. I won't be positive about that.

Q. Then in addition to that this 2½ inch stream without any nozzle was going into the engine?

A. Yes, sir.

Q. How far was it in the way of blocks where they were using it?

A. It was across from 6-h to 7th Avenue—about 400 feet North of Seventh Avenue, which would be about 800 feet.

Q. You say, I believe, that water pipes deliver in proportion the squares?

A. That's the way we generally figure it.

Q. You spoke of the time when the pressure went temporarily down at the time of a freeze, what freeze was that?

A. I can't remember the year nor the date. We had several freezes—severe freezes.

Q. That particular freeze, was it a- unusual freeze or an ordinary freeze?

A. Severe.

Q. How did it compare in severity with other freezes you have had from 1895 to the present?

A. It was one of the most severe freezes we have ever had.

197 Q. You say during that freeze besides this broken pipe people let the water run to prevent freezing, did they?

A. O, yes, sir.

Q. How long after the pressure dropped low before the company began to restore it?

A. At that particular time?

Q. Yes?

A. Well, sir, nothing to do but to try to stop the waste at different places.

Q. You did that did you?

A. We were looking after that during the whole time of the freeze.

Q. At the Swift fire and these other fires when they gave the still alarm, will you explain how the pumps, if they had been started to work, would have given better pressure?

A. This pump discharges through an eight inch pipe into three

ixes. The Rose Hill pressure is only obtained two sixes—two six nch pipes.

Q. So you would have had more pipes to bring it down?

A. Yes, sir. It is generally found that it made a difference of rom 10 to 15 pounds when the pump was running.

Q. That was actual, through the gauge?

A. Observation.

Q. You said in the summer of 1902 when the domestic pressure got to be low at times, was that during this protracted drought or lid you speak of some usual drought?

A. Yes, sir; and prior to that whenever we pumped into the Rose Hill standpipe.

Q. Now when you would pump into Rose Hill and the pressure would get low in the lower city, how did that affect the avail-

198 able fire pressure?

A. Well, sir; not any compared to what it would have been if the pressure had been more.

Q. You still had your fire pressure to turn on?

A. Yes, sir. Very careful to try to keep as much water in the Rose Hill standpipe as possible.

Q. You spoke of the Rankin House, complaint as to poor pressure in 1902: Mr. Preer, you were asked whether at any time the pumps gave direct pressure to the system: you said once when you were repairing the standpipe that you were prepared to give direct pressure and did give direct pressure; were you prepared to give direct pressure if it had been called for at all other times?

A. It would have been necessary to have cut off the water going into the Rose Hill standpipe.

Q. How would that have been done?

A. We would have had to gone to Rose Hill and cut the valves off.

Q. You have the valves and not anything to do but to turn it off?

A. Had a valve and had a gauge in the box where the valve was.

Q. What I mean were you equipped so that that could have been done, if you had been requested or any need for it?

A. Yes, sir.

Q. You say you had a gauge which you consulted every day, your testimony as to pressure, explai- now the difference between the gauge that you had and the gauge that was at the engine house?

A. Well, sir, the gauges I believe, were made by the same people.

Q. What was the difference?

199 A. Well, sir, the gauge at the engine house usuall- showed a fraction more than ours, on account of the difference in elevation.

Q. Was there a record kept by your gauge?

A. None at all. The clock work part of our gauge was broken.

Q. What are these papers here brought into court by the city?

A. They are the daily records taken from the gauge.

Q. Recording gauge keeps those records showing the pressure?

A. Yes, sir.

Q. The gauge that you speak of, that you looked at several times a day, did that make any record or simply showed it?

A. No, sir; did not at that time.

The MASTER: Didn't you bring this out in your direct examination?

Mr. WIMBERLY: I don't remember whether I brought it out as full. I did go in and prove the fact that they had a recording gauge.

Q. You were asked about flushing out the system: You say you did have a man employed to flush out the dead ends?

A. Yes, sir; we did that regularly.

Q. Why was it you did not flush out the rest of the system where you had connections?

A. Because the water circulated through those pipes.

Q. Where the daily consumption of the city averages about a million gallons per day, what is the amount of circulation through those pipes?

A. Well, sir, excluding the dead ends, keeps it moving
200 pretty rapidly, I should think.

Q. That quantity would mean pretty lively circulation, wouldn't it?

A. Yes, sir.

Q. I believe you say from '95 up to the present there has not been much change in the daily consumption?

A. No, sir. We have cut off considerable waste in the last few years.

Q. So it has kept up about the same?

A. Yes, sir.

Q. With that quantity of water flowing through the pipes every day, nearly a million gallons, would you say at these dead ends, where you flush the mains, was live running water or stagnant water?

A. It was live. Of course less though in some districts where there was not so much use.

Q. Where it was the least used, the water passing throug- those districts, if you had a circuit to come around to the other parts where you used more—In other words: circulation would keep up through the whole system?

A. Yes, sir; excluding the dead ends.

Q. During the time that there was less circulation, if there was any tendency of sediment to be deposited, what would become of that sediment when circulation was started up?

A. Well, sir, it would depend upon the draught of the water—the volume of water taken out. Through a small opening it would not tend to remove much of the sediment.

Q. I believe you say you actually took up pipes from time
201 to time?

A. Yes, sir.

Q. Would that, as a matter of fact, show whether there was any considerable deposit or sediment?

A. Before we began filtering the water, there was always an amount of sediment in the water in the bottom of the pipe.

Q. What was the character of that sediment?

A. Well, sir, seemed to be muddy.

Q. Just ordinary mud sediment?

A. Yes, sir.

Q. I will ask you whether the amount of sediment was such or sufficient to discolor the water to any appreciable extent that you would use?

A. Drawing it from an ordinary small opening it would not.

Q. Since the filter plant has been put in has there been any sediment in any of these pipes to speak of?

A. Not since we have flushed the system out thoroughly.

Q. You spoke of being becoming convinced for the first time that the supply main was too small, was that before or after your pumping engines were put in?

A. That was after—The present pumping machine?

Q. The present pumping machine?

A. That was before the present pumping machine.

Q. The pumps that you now have at the filter plant how do they compare in size and power with the pumps that existed prior to 1902?

A. Both have the same capacity—their pump is about one
202 third larger than the pump used prior to that time.

Q. Prior to that time how many pumps did you have?

A. Had two.

Q. Now you have how many?

A. Have four.

Q. So you not only have increase- in number but they are larger pumps?

A. Yes, sir.

Q. I will ask you this: When you use the pump, the pressure that you get from the pumping, does that increase or modify the quantity of water that comes through the same size supply main?

A. Increases.

Q. With the increase that you have in using these size pumps, I will ask you whether or not the supply main now is sufficient to deliver an ample supply of water to the city for its present needs?

A. In certain places I think the system needs some re-enforcement.

Q. Not speaking where you have smaller four inch mains, but the main supply pipe, 12 inch pipe, is that sufficient?

A. Yes, sir.

Q. In some places you say it could be re-enforced?

A. Yes, sir.

Q. Have there been any re-enforcements?

A. Yes, sir; we laid a six inch pipe on Second Avenue from 15th to 17th Streets replacing a four.

Q. Mr. Wimbish asked you about the submerged main?

The MASTER: Was that done before or since the Receivership?

203 A. That was done in '94, to the best of my recollection.

Q. There was re-enforcing done before the Receivership?

A. Yes, sir; we did some along as we were able to.

Q. Explain this map on this portion. Front Street between Tenth and 12th and then out a part of 12th Street, there is a double line, what does that represent?

A. That represents a four inch pipe line and a six.

Q. Which was laid first?

A. The four.

Q. Why was the six inch afterwards laid?

A. To give them better fire protection.

Q. You re-enforced the four on that street?

A. Yes, sir.

Q. In addition to Front Street there is a double line *of* 12th Street, what is that?

A. That was in order to connect in with the 10 inch main on Broad Street.

Q. That increased the capacity of the other one by paralleling it?

A. The four and the six are supplied from the 10 inch on Broad Street.

Q. Speaking of flushing sewers and flushing the pipes: when you have a fire and considerable water is used from the hydrants, what effect, if any, has that in flushing out the system?

A. I don't understand that clearly.

Q. When you use water: you speak of a man flushing the dead ends regularly, when you use water at a fire what effect has that towards flushing the system?

204 A. The same effect, practically.

Q. There is a man employed for that purpose?

A. Yes, sir; to flush the sewers.

Q. The same way?

A. Has the same effect.

Q. You speak about 1902 when the company took steps to increase and a representative going on to get the money: do you know whether any one actually came and made plans?

A. Yes, sir; Mr. Leddeaux.

Q. Who is Mr. Leddeaux?

A. Chief Engineer for the American Pipe Mfg. Co.

Q. Do you know what business the American Pipe Mfg. Co. are in?

A. They own quite a number of water works systems in different cities.

Q. Construct systems, do they?

A. Yes, sir.

Q. Is their business in that line extensive, or do you know?

A. Yes, sir; Mr. Leddeaux told me himself that they operated about 40 different systems.

Q. He came down here for what purpose?

A. To see what improvements were necessary and how much it would take to make those improvements.

Q. What time was it that he was down here, do you remember?

A. In May, I think, sir.

Q. Do you know how long after Mr. Leddeaux'- visit that the city held up payment of water rentals?

205 A. First day of July.

Q. What effect did the holding up on that payment have on the carrying out of these works?

A. It affected our prospects of being able to get the necessary funds.

Q. Prior to '02 when you made monetary arrangements, did any expert come down and actually make plans: What did the company do looking to the future extension of its supply?

A. Well, sir, about the time I was first employed by the company as collecter, they bought a number of acres of land around the reservoir there for the purpose of impounding more water and to obtain privileges to increase the supply generally.

Q. You mean privileges to back water on more land—on adjoining land?

A. Yes, sir.

The MASTER: Didn't you go over that in your direct examination?

Mr. WIMBERLY: No, sir.

Q. What spring is that over there?

A. What is known as the Stewart Spring.

Q. Where is that spring located?

A. I have never been to the spring myself. It is north east of the upper reservoir, according to my idea about it.

Q. It is near there?

A. Yes, sir.

Q. You know how it flows?

206 A. It flows through this land we bought, there being a hill between the reservoir and this stream near the reservoir. They had figured on conveying this water there by means of laying a pipe there, or else building a reservoir on this land we bought and raise it to a proper height and make it flow by gravity into the lower reservoir.

Q. As it now stands does it flow into the stream above or below the reservoir?

A. Below.

Q. So by piping it above it would add that much to the supply of the reservoir?

A. Yes, sir.

Q. Do you know what size stream that is?

A. Yes, sir: ordinarily it would flow about 400 or 500 gallons a minute. That is based upon my having seen the stream. I have never measured it.

Q. That much a minute?

A. Yes, sir.

Q. That would be some 700,000 gallons a day?

A. Yes, sir: in ordinary stage of it.

Q. You speak of plans for laying out another reservoir to bring

this high enough: under the plans what number of gallons would the reservoir hold, do you remember, additional?

A. Mr. Leddeaux walked over the ground with me and he said, rough estimate, he would place it at 100,000,000 gallons; although the engineer that laid it out claimed 400 million.

Q. What time was it that Mr. Leddeaux was down here?

207 The MASTER: He said in May, 1902.

A. In May, 1902. That's the year it went dry.

Q. The year it went dry?

A. Yes, sir.

Q. No dispute about the year. Give the time of the year: What time in the year had it shown signs of going dry?

A. Well, sir, at the time Mr. Leddeaux was here, the upper reservoir was down about two feet.

Q. So at the time the upper reservoir—at the time Mr. Leddeaux was here the upper reservoir had not failed at all?

A. No, sir.

Q. And the lower reservoir?

A. Was full.

Q. At the time you speak of the holding up of this payment that broke up these plans, had the water entirely failed in the reservoir?

A. No, sir; not entirely.

Q. Still water on hand at that time?

A. Yes, sir.

Q. You speak of the precautions, the man employed to keep the water pure over there, will you explain what effect having two reservoirs, an upper and lower reservoir and drawing water from the lower reservoir, has on keeping the water supply to the city pure?

A. Nearly all water works systems have a settling basin or reservoir. It is absolutely — to have a place to settle the muddy water.

208 Q. What is the purpose of that upper reservoir?

A. To settle the water so as to keep the muddy water out of the distributing reservoir.

Q. From the upper reservoir how does the water get into the lower reservoir?

A. We have a water gate and a pipe leading from that gate into the lower reservoir.

Q. That water gate takes the water from what part of the upper reservoir?

A. Flows from the top of it into the by-pass; and that gate is constructed in the side of the by-pass.

Objected to as not being in rebuttal and objection overruled.

Q. In the settling basin, where does the mud go?

A. To the bottom of the basin.

Q. So where you draw it at the gate from the top: You say this gate is at the top, what sort of water do you get?

A. The water flows over the side of the wier of the dam into the

by-pass and the gate which opens into this pipe is in the side of the by-pass.

Q. Here's what I want to get at: the effect of having that gate at the top of the water and the mud going to the bottom, gives you what kind of water?

A. To take the water from the top gives the clearest water.

Q. You were asked about the time the water nearly failed in 1895, you said something about catching fish, I believe: I will ask you this: before there was any reservoir there at all and dam built, was there a stream there?

209 A. O, yes, sir.

Q. When you speak of the reservoir failing, had the stream itself dried up?

A. Not entirely.

Q. There was a running stream all the time?

A. Yes, sir.

Q. Running through the upper reservoir?

A. Yes, sir.

Q. And through——

A. Into the lower.

Q. That stream never had failed?

A. No, sir; not at all—never has failed entirely.

Q. In '02 when you speak of the water getting out of the reservoir and the water getting so low that the city condemned it, did the stream itself entirely dry up?

A. Not entirely. The amount was so small it did not amount to much.

Q. These other streams that he asked you about if they failed: Did the dry weather affect all the streams around Columbus?

A. Well, sir, the dinner toters walked across the Chattahoochee River up there by the railroad bridge; and nearly every stream in the country, if it did not dry up entirely, got very low, I believe, that I heard of.

Q. The Chattahoochee is a stream that is ordinarily navigable to Columbus, isn't it?

A. Yes, sir.

Q. A good, big stream: Boats come up to Columbus?

A. Yes, sir.

210 Q. Run regular schedules, don't they?

A. Yes, sir.

Q. I believe you said something about the drought being comparatively local: there were rains in the upper part of the Chattahoochee River?

A. Yes, sir; small showers, comparatively.

Q. They had rains on the small streams above that run into it?

A. Yes, sir; the Mulberry and Standing Boy Creek didn't dry up entirely; and their water shed is from a district of red hills which caused the water to be very muddy.

Q. You say Roaring Creek and Standing Boy are muddy streams?

A. Yes, sir; especially in rainy weather.

Q. How about Roaring Creek during this dry spell?

A. It didn't dry up entirely. It got very low.

Q. At the time of that drought, what stream is there around Columbus, stream or streams, taking them all in, that would have furnished an abundant supply of pure water?

A. Well, sir, I don't know of any of my own knowledge, near by.

Q. I mean near Columbus?

A. Yes, sir.

Q. At the time of these dry spells I believe you testified that stagnant water would not be fit to drink: At the time of these different dry spells, was there running water at all times coming in?

A. Yes, sir.

Q. I will ask you whether in any of these dry spells, prior
211 to the failure of the reservoir in 1902, whether the quantity of water that the citizens was furnished was ever curtailed or lessened?

A. No, sir.

Q. There was a supply each day—same quantity in the pipes?

A. Yes, sir.

Q. The pipes never got empty?

A. No, sir.

Q. When you speak of the streams partially failing, the effect of that was, I suppose, that the daily quantity used came to be greater than the quantity going in?

A. Yes, sir.

Q. So each day——

A. Decreased the supply in the reservoir.

Q. The reservoir was decreased?

A. Yes, sir.

Q. Decreased the amount that the daily consumption exceeded the quantity that the stream brought?

A. Yes, sir.

Q. I believe you told Mr. Wimbish, taking in the amount or the number of miles of pipe that the present system has, it is something over 1/5th larger than 1895: How does the general average of size of pipes compare now with what it was in '95?

A. It has been increased by laying nothing less than six inch mains.

Q. What effect has that had on the average size of the pipes?

A. You mean as to the whole city?

212 Q. Taking it altogether: Has it raised the average of the pipes?

A. It has increased the average, yes, sir.

Q. You say during that time there has been no increase, practically, in the consumption?

A. Legitimate consumption. The legitimate consumption has increased.

Q. The actual quantity used is about the same now as in '95, the number of gallons per day?

A. There is more water legitimately used than there was.

Q. Less waste?

A. Yes, sir.

Q. How does the total quantity that is used in the city, pumped in and consumed in one way and another, how does it compare now with what it was in '95?

A. In my opinion there is very little difference. I know very well the waste we have checked from year to year.

Q. You speak of having removed several dead ends by running these connections and making a circuit: Have you increased the number of dead ends?

A. We have put in one since the receiver took charge, from Broad to Front Street, at the Brewery.

Q. How long is that?

A. About 450 feet.

Q. Short side of a block?

A. Yes, sir.

Objected to by the respondents as not being in rebuttal. Objection overruled.

213 Q. How do the dead ends now, both in length and number, compare with what they were in '95?

A. In the lower part of the city?

Q. I am speaking about the lower city?

A. Virtually speaking no difference—there has been no increase in the dead ends: I would say there is a great difference too: in '95 we connected up two dead ends and later we connected up three others. So there are about four dead ends less.

Q. Four less in number?

A. Yes, sir.

Q. Those four how do they compare in length, the dead ends, from the nearest circuit with what they were before they were connected up, is the distance here (referring to map) greater or less?

A. The distance is less.

Q. The circuit then has not only diminished the number of dead ends, but the length of the dead ends, is that right?

A. Yes, sir.

The MASTER: Don't lead him, Mr. Wimberly.

Q. In comparing the system at this time with what it was in '95, the effect of the greater pressure from Rose Hill standpipe, how does it affect the general efficiency of the system and the quantity of water it can deliver and the pressure under which it can deliver it, compared with what was the case in '95?

A. Well, sir, it about doubles the capacity of the system

214 Q. Under greater pressure does more water go through the same size of pipe?

A. Yes, sir.

Recross-examination.

(By Mr. MARTIN:)

Q. You say at the present time the efficiency of the system is very much better than it was in '95?

A. Yes, sir.

Q. Who brought about that improvement?
A. Who brought it about?
Q. Yes?
A. The Receiver.
Q. That's what I thought. You say in cases of very low water supply, that there is as much water used in the city as there was before?
A. I think there is a little more on account of the dry weather the sprinkling of the streets.
Q. Isn't it a fact that when the pressure is very low that they can't use as much water in sprinkling streets and lawns as when the pressure is better?
A. They can but they have to take a little more time.
Q. The hose won't throw it as far?
A. No, sir.
Q. Therefore you can't water as much ground?
A. It takes more time to do the same work.
Q. The question was asked you by Mr. Wimberly as to the flushing of sewers: That is done by the city authorities?
A. Yes sir.
215 Q. Isn't there an agreement between the city and the water works people with reference to that?
A. I believe they pay us 40 cents per hour.
Q. They get pay for it?
A. Yes, sir.
Q. The city is not doing it without any authority?
A. No, sir.
Q. Hasn't it always been done at night?
A. Yes, sir.
Q. At times when there is less consumption of water?
A. Not at times when there is less. They usually do their flushing after the day is over, up to about nine or ten o'clock at night.
Q. Isn't it a fact that there is less consumption of water by consumers during that time than in the middle of the day?
A. No, the consumption of water about first — night is about equal to any other part of the time of the day, from the fact that they use water to wash dishes, bathing and for other purposes.
Q. How do you know at the time you were making this test on 6-h Avenue in 1900, that the Southern Ry. was taking water into an engine?
A. I saw them; and others present saw them.
Q. You know that then of your own knowledge?
A. Yes, sir.
Q. When did you say the city refused payment in 1902?
A. First day of July, 1902. It was the year that the water works went dry.
216 Q. Didn't you state on yesterday that it was for the quarter beginning in July and that they always paid after the water was furnished and therefore it was the first of October?
A. I would like to explain: I don't remember testifying in regard to the payment of any bill at all this morning. I think the evidence

given by the Treasurer is confused with mine. I presented a bill in July myself, which was for the months of April, May and June. That bill was held up until October. Mr. Chappell paid us the bill for April, May and June and says: "I will hold up this bill for July, August and September," because that was the time in which we were furnishing river water.

Q. Mr. Wimberly got you to explain a little while ago about the water going into the lower from the upper reservoir. I understood you to say that the water let into the lower reservoir for use is through the by-pass?

A. Yes, sir; when the reservoir is full.

Q. That's from the by-pass?

A. Or as long as it is within six feet of full.

Q. When it gets below that six feet how do you let it in?

A. We have three gates constructed in the middle of the dam. The gate in the middle remains down to the ground. The gate next to the water is opened up; and the water flows over the top of the middle gate and out under the third gate.

Q. You never open that lower one at all: What's the use
217 of that lower one at all, the one at the bottom?

A. That's to be used if you want to empty the reservoir or we used it when the reservoir got to where we could not get water around that by-pass.

Q. When the water is at its lowest in the upper reservoir that's the time it is most impure?

A. Yes, sir.

Q. During those times you have to get it from the lower one?

A. Yes, sir; we draw it through the gates in the middle of the dam.

Q. When the water gets low in the upper reservoir, is it not a fact that there is a good deal of area that is covered with mud that is left exposed to the rays of the sun?

A. Yes, sir.

Q. Suppose when the area is covered there is a good deal of vegetable matter in it, is there not?

A. Yes, sir; we spent in '92 nearly a thousand dollars to keep the grass cut.

Q. In '92?

A. No, sir; in 1902, I should have said, when it went dry.

Q. How much did you spend in these other years?

A. Well, sir; the droughts in the other years generally came in the Fall and there was very little grass that would grow; and there was very little money spent; and the droughts were not so long.

Q. There would be vegetable matter?

A. No, sir; it was kept removed if there was any.

218 Q. Kept removed?

A. Yes, sir; growing up in there.

Q. When that large area was covered with mud and this vegetable matter, suppose there came a hard rain, would it not wash right into the reservoir?

A. We hauled it out.

Q. Hauled what? Hauled out the mud?

A. Hauled out the vegetation and this grass.

Q. Well, the other part that had been baking there in the sun, and there came a hard rain wouldn't it wash right into the water?

A. It would into the water of the upper reservoir in case of a rain, though we ceased using from the upper reservoir, only used what was in the lower reservoir until we could get that settled to a certain degree, any way.

Q. But that same water would finally go into the lower reservoir?

A. Yes sir; after it would settle, that is, in case of a rain. During a drought that don't amount to nothing only fill the upper reservoir.

Q. You mean to say that the upper reservoir is not regarded as a storage reservoir?

A. Yes, sir; storage supply reservoir. That is the main purpose of the reservoir.

Q. Do you know when it was built?

A. I don't know exactly. It was there the first time I ever went there.

Q. There never has been any effort made to remove these thin edges by having marginal depths?

A. Yes, sir; we bought several hundred dollars' worth of lumber from W. T. Rutledge, Crawford, Alabama; and the lumber
219 was delivered but for the lack of means we were unable to complete the work.

Q. When was that?

A. Shortly after '95. I don't remember the date exactly. I can get it from our books.

Q. You didn't use it?

A. No, sir; not for that purpose; but some of the lumber is piled up there now.

Q. Did the water works company, during the time of your connection with it, ever use any river water to supply the mains except during the time intervening between the washing away of that submerged main and the stringing of the pipe around over the railroad bridge?

A. None, except during March when the bridge washed away and during the summer when the reservoir went dry—not a drop.

Q. You never used any prior to that?

A. No, sir.

Q. When this submerged main broke, I understood you to say it was perhaps 8 or 10 hours before you got the water stopped from running out?

A. Yes, sir.

Q. After that time then did you use any more river water—any more water from the reservoir until you got this circuit completed?

A. No, sir.

Q. Then the reservoir filled up?

A. The reservoir was full. We just had a freshet and nearly everything washed away over there.

Q. You got that completed, you say, about the middle of April?

A. No, sir; in 30 days from the date the bridge washed
220 away, which was the first of April.

Q. By the first of June or the last of June that supply had entirely failed?

A. Not entirely. In July I was over there myself to look after the way in which these gates in the dam had been opened and the upper reservoir still had considerable water in it, in July. It was after the 4th of July because we had a barbecue out home on the 4th of July; and Dr. Wiley, Mr. Reid and several other gentlemen were having a barbecue over there the day I went to look after these gates; so I know it was after the 4th of July when we had water in the upper reservoir—considerable water.

Q. What do you call considerable?

A. Well, sir, about six feet deep at the dam; and backed out some 200 feet.

Q. Two hundred feet?

A. Yes, sir.

Q. Still that would leave a good many acres of ground that had no water on it?

A. Yes, sir.

Q. When did you cease to use the water?

A. We ceased to use the water when it became foul and the Sanitary Inspector and some of the city authorities condemned it.

Q. Wasn't it foul here when it was only about——

A. Not to the extent as to make it unfit for use.

Q. What do you term water unfit for use?

A. Well, sir——

Q. What state does it get into when you say it is unfit for use?

221 A. The only way I have to tell is when it stinks.

Q. Did it stink?

A. It did when they condemned it.

Q. Didn't it stink, before?

A. I suppose it did, 10 days may- or longer before they took those steps.

Q. You still furnished it along?

A. We didn't know of any better that we could get.

Q. You found out better after they condemned it, did you not?

A. No, sir; don't know that we did.

Q. You think river water was no better?

A. In my opinion it was not but little better. It did not stink, that's the only difference.

Q. Mr. Preer, I believe you answered in reply to a question asked you by Mr. Wimberly, that the opening of these hydrants for fire purposes and for the flushing of sewers, would take out all the sediment in the pipes?

A. I didn't say that. It would have the same effect as opening the hydrants to flush the mains.

Q. Didn't you, in answer to his question, in which he stated "it would do it entirely;" and didn't you answer yes?

A. I don't remember that I answered such a question that way.

Mr. WIMBERLY: I never used the word entirely.

The MASTER: Let's get what the witness meant by it.

Q. I will ask you the question if that would have the
222 effect of removing it entirely.

A. Well, sir, as to whether it would remove it entirely, of course I can't tell except where I could see inside of the pipe. Since we have flushed every hydrant in the city, the pipes are clean and the only time, in my recollection, that they have not had sediment in the bottom of them. There may be pipes in the city that has it in it now, I can't tell; but I have done everything in my power to free it from any.

Q. Mr. Preer, the increased capacity of the pumps that you referred to as having been put in this system, that was done by the Receiver, wasn't it?

A. Yes, sir.

Q. Couldn't the water works company have done it themselves before?

Q. No, sir; except to install the first pumping machinery.

Q. Why didn't they do what the Receiver has done?

A. Didn't have the money.

Q. It was necessary to be done, wasn't it?

A. Yes, sir; it appeared so.

Q. What the Receiver has done was necessary to have done.

A. Yes, sir; to meet the demands of modern times. The people want filtered water and more pressure.

Q. It was never done except under the order of the court?

A. No, sir.

Q. You say re-enforcement of this system was done prior to what the receiver did: Did you do anything except to build that stand-pipe and put in those pumps?

223 A. There were some mains laid in the lower part of the city that connected up those dead ends that I spoke of.

Q. Mr. Preer, when was this purchase made which included the Stewart Branch or Spring?

A. I think that was made about 1892. I may miss it six months or a year. I can't tell exactly—way back there.

Q. There were never any steps taken to develop it?

A. Yes, sir; they spent some money over there cleaning out.

Q. They didn't develop it, did they?

A. Not to the extent that they could obtain the water into our reservoirs.

Q. Was it practical?

A. Yes, sir; it was practical.

Q. Then why didn't they do it?

A. Well, sir, the amount of water obtainable from that spring would not amount to very much except in dry weather. These droughts came along every two years, you might say, the distance of time between them was considerable; and since I have been with the water works company I don't remember a time that they have had much money over and above their expenses, if any.

Q. Wasn't it for the want of money?

A. Yes, sir.

Q. Didn't you state awhile ago that the capacity of that spring, in ordinary times, would produce 700,000 gallons per day?

A. No, sir; I said 400 or 500 gallons a minute. I have not figured it out.

224 Q. 500 gallons a minute would be how many gallons—it would be 30,000 gallons an hour?

A. Yes, sir.

Q. And 24 times that would be 720,000 gallons in 24 hours: It had that capacity?

A. Yes, sir.

Q. By erecting a dam, according to some engineer's idea, it would create a storage reservoir of about 400,000,000 and according to Mr. Leddeaux about one hundred million?

A. Yes, sir.

Q. Wouldn't increasing it even one hundred million and with a natural supply of 700,000, that would have been an ample supply of water?

A. Yes, sir.

Q. You would not use very much more than that: You were not using very much more than that at that time?

A. Yes, sir; using about as much water then as now. Very little difference.

Q. Lacked three hundred thousand gallons of being a million?

A. Well, sir, I had no means of telling how much was there. An expert can figure how much water flows through a pipe, that is, what it will be under a certain head and given pressure down near where the water is drawn; but whether they can get at it accurately I don't know.

Q. I am asking you what you know. You are a practical man, if they had built that reservoir: Do they own the land?

A. Yes, sir; own it now.

Q. If they had built that reservoir isn't it a fact that they would have had an ample supply of water all the time?

A. I have always thought that——

225 Q. (Interrupting.) A. Answer that question: wouldn't they have had an ample supply all the time?

A. Yes, sir; they would have had.

Q. Then that's a fact?

A. Except in cases of drought like we did have. In case of a drought such as we had in 1902, I believe the water would have become stagnant. We would have had plenty of water but it would not have been any good unless it was good water.

Q. If it had been filtered it would have been good?

A. When it gets in that state I don't think it is good after it is filtered. Don't think it would be. Don't think you can filter the scent out of it.

Q. You would have had 100,000,000 gallons more of water to have started with in a drought?

A. Yes, sir.

Q. That will last sometime, won't it?
A. Yes, sir.
Q. Then as a matter of fact the scarcity of water in 1902 and in 1895 was not due to the unusual drought, was it: Wasn't it due to the fact that they did not build that dam for that supply of water?
A. If that dam had been erected we would have had more water to have drawn upon during the drought.
Q. Isn't that the object of an impounding reservoir?
A. Yes, sir; to store water.
Q. So you would have had that to have drawn from?
A. Yes, sir.

226 (By Mr. WIMBERLY:)

Q. This 700,000 gallons of water from Stewart Spring that you speak of, that in ordinary times or dry season?
A. I mean by that when the stream is flowing its best. Not during a freshet.
Q. Such a drought as you had in 1902, did that affect the Stewart Spring like it did the other?
A. Yes, sir; we could not obtain 50 gallons per minute out of that branch during that drought, that is, the last of the drought.
The MASTER: You mean to say in your estimate of 500 gallons per minute as the flow of Stewart Spring, that the normal flow in ordinary times?
A. Yes, sir.
Q. You were speaking about the re-enforcements by the receiver, which you have already specified: How much of that was during the receivership and how much prior to the receivership?
A. No, sir; I don't think I specified what has been done since the receiver took charge.
Q. You specified, I believe, fully what was done before the receiver in detail?
A. Yes, sir.
Q. What improvements you were speaking of by the receiver were in addition to those you have specified?
A. Yes, sir.
Q. All those you testified to were before the receiver?
A. Yes, sir.

(By Mr. MARTIN:)

Q. Don't you gather the water in a large impounding reservoir at times during normal flow, isn't that a fact?
227 A. I don't understand exactly.
Q. You stated that the Stewart Spring at its normal stage had a capacity of 500 gallons per minute or 720,000 gallons in 24 hours: If you had had this other reservoir you would fill that up, the Stewart Branch Reservoir, during normal times, wouldn't you?
A. Yes, sir.
Q. It would not have run dry, would it, entirely during '02?
A. No, sir; a certain amount of water is lost by evaporation.

sixes. The Rose Hill pressure is only obtained two sixes—two six inch pipes.

Q. So you would have had more pipes to bring it down?

A. Yes, sir. It is generally found that it made a difference of from 10 to 15 pounds when the pump was running.

Q. That was actual, through the gauge?

A. Observation.

Q. You said in the summer of 1902 when the domestic pressure got to be low at times, was that during this protracted drought or did you speak of some usual drought?

A. Yes, sir; and prior to that whenever we pumped into the Rose Hill standpipe.

Q. Now when you would pump into Rose Hill and the pressure would get low in the lower city, how did that affect the avail-
198 able fire pressure?

A. Well, sir; not any compared to what it would have been if the pressure had been more.

Q. You still had your fire pressure to turn on?

A. Yes, sir. Very careful to try to keep as much water in the Rose Hill standpipe as possible.

Q. You spoke of the Rankin House, complaint as to poor pressure in 1902: Mr. Preer, you were asked whether at any time the pumps gave direct pressure to the system: you said once when you were repairing the standpipe that you were prepared to give direct pressure and did give direct pressure; were you prepared to give direct pressure if it had been called for at all other times?

A. It would have been necessary to have cut off the water going into the Rose Hill standpipe.

Q. How would that have been done?

A. We would have had to gone to Rose Hill and cut the valves off.

Q. You have the valves and not anything to do but to turn it off?

A. Had a valve and had a gauge in the box where the valve was.

Q. What I mean were you equipped so that that could have been done, if you had been requested or any need for it?

A. Yes, sir.

Q. You say you had a gauge which you consulted every day, your testimony as to pressure, explai- now the difference between the gauge that you had and the gauge that was at the engine house?

A. Well, sir, the gauges I believe, were made by the same people.

Q. What was the difference?

199 A. Well, sir, the gauge at the engine house usuall- showed a fraction more than ours, on account of the difference in elevation.

Q. Was there a record kept by your gauge?

A. None at all. The clock work part of our gauge was broken.

Q. What are these papers here brought into court by the city?

A. They are the daily records taken from the gauge.

Q. Recording gauge keeps those records showing the pressure?

A. Yes, sir.

Q. The gauge that you speak of, that you looked at several times a day, did that make any record or simply showed it?

A. No, sir; did not at that time.

The MASTER: Didn't you bring this out in your direct examination?

Mr. WIMBERLY: I don't remember whether I brought it out as full. I did go in and prove the fact that they had a recording gauge.

Q. You were asked about flushing out the system: You say you did have a man employed to flush out the dead ends?

A. Yes, sir; we did that regularly.

Q. Why was it you did not flush out the rest of the system where you had connections?

A. Because the water circulated through those pipes.

Q. Where the daily consumption of the city averages about a million gallons per day, what is the amount of circulation through those pipes?

A. Well, sir, excluding the dead ends, keeps it moving
200 pretty rapidly, I should think.

Q. That quantity would mean pretty lively circulation wouldn't it?

A. Yes, sir.

Q. I believe you say from '95 up to the present there has not been much change in the daily consumption?

A. No, sir. We have cut off considerable waste in the last few years.

Q. So it has kept up about the same?

A. Yes, sir.

Q. With that quantity of water flowing through the pipes every day, nearly a million gallons, would you say at these dead ends where you flush the mains, was live running water or stagnant water?

A. It was live. Of course less though in some districts where there was not so much use.

Q. Where it was the least used, the water passing through those districts, if you had a circuit to come around to the other parts where you used more—In other words: circulation would keep up through the whole system?

A. Yes, sir; excluding the dead ends.

Q. During the time that there was less circulation, if there was any tendency of sediment to be deposited, what would become of the sediment when circulation was started up?

A. Well, sir, it would depend upon the draught of the water—the volume of water taken out. Through a small opening it would not tend to remove much of the sediment.

Q. I believe you say you actually took up pipes from time
201 to time?

A. Yes, sir.

Q. Would that, as a matter of fact, show whether there was a considerable deposit or sediment?

A. Before we began filtering the water, there was always an amount of sediment in the water in the bottom of the pipe.

Q. What was the character of that sediment?

A. Well, sir, seemed to be muddy.

Q. Just ordinary mud sediment?

A. Yes, sir.

Q. I will ask you whether the amount of sediment was such or sufficient to discolor the water to any appreciable extent that you would use?

A. Drawing it from an ordinary small opening it would not.

Q. Since the filter plant has been put in has there been any sediment in any of these pipes to speak of?

A. Not since we have flushed the system out thoroughly.

Q. You spoke of being becoming convinced for the first time that the supply main was too small, was that before or after your pumping engines were put in?

A. That was after—The present pumping machine?

Q. The present pumping machine?

A. That was before the present pumping machine.

Q. The pumps that you now have at the filter plant how do they compare in size and power with the pumps that existed prior to 1902?

A. Both have the same capacity—their pump is about one
202 third larger than the pump used prior to that time.

Q. Prior to that time how many pumps did you have?

A. Had two.

Q. Now you have how many?

A. Have four.

Q. So you not only have increase- in number but they are larger pumps?

A. Yes, sir.

Q. I will ask you this: When you use the pump, the pressure that you get from the pumping, does that increase or modify the quantity of water that comes through the same size supply main?

A. Increases.

Q. With the increase that you have in using these size pumps, I will ask you whether or not the supply main now is sufficient to deliver an ample supply of water to the city for its present needs?

A. In certain places I think the system needs some re-enforcement

Q. Not speaking where you have smaller four inch mains, but the main supply pipe, 12 inch pipe, is that sufficient?

A. Yes, sir.

Q. In some places you say it could be re-enforced?

A. Yes, sir.

Q. Have there been any re-enforcements?

A. Yes, sir; we laid a six inch pipe on Second Avenue from 15th to 17th Streets replacing a four.

Q. Mr. Wimbish asked you about the submerged main?

The MASTER: Was that done before or since the Receivership?

203 A. That was done in '94, to the best of my recollection.

Q. There was re-enforcing done before the Receivership?

A. Yes, sir; we did some along as we were able to.

Q. Explain this map on this portion. Front Street between Tenth and 12th and then out a part of 12th Street, there is a double line, what does that represent?

A. That represents a four inch pipe line and a six.

Q. Which was laid first?

A. The four.

Q. Why was the six inch afterwards laid?

A. To give them better fire protection.

Q. You re-enforced the four on that street?

A. Yes, sir.

Q. In addition to Front Street there is a double line *of* 12th Street, what is that?

A. That was in order to connect in with the 10 inch main on Broad Street.

Q. That increased the capacity of the other one by paralleling it?

A. The four and the six are supplied from the 10 inch on Broad Street.

Q. Speaking of flushing sewers and flushing the pipes: when you have a fire and considerable water is used from the hydrants, what effect, if any, has that in flushing out the system?

A. I don't understand that clearly.

Q. When you use water: you speak of a man flushing the dead ends regularly, when you use water at a fire what effect has that towards flushing the system?

204 A. The same effect, practically.

Q. There is a man employed for that purpose?

A. Yes, sir; to flush the sewers.

Q. The same way?

A. Has the same effect.

Q. You speak about 1902 when the company took steps to increase and a representative going on to get the money: do you know whether any one actually came and made plans?

A. Yes, sir; Mr. Leddeaux.

Q. Who is Mr. Leddeaux?

A. Chief Engineer for the American Pipe Mfg. Co.

Q. Do you know what business the American Pipe Mfg. Co. are in?

A. They own quite a number of water works systems in different cities.

Q. Construct systems, do they?

A. Yes, sir.

Q. Is their business in that line extensive, or do you know?

A. Yes, sir; Mr. Leddeaux told me himself that they operated about 40 different systems.

Q. He came down here for what purpose?

A. To see what improvements were necessary and how much it would take to make those improvements.

Q. What time was it that he was down here, do you remember?

A. In May, I think, sir.

Q. Do you know how long after Mr. Leddeaux'- visit that the city held up payment of water rentals?

A. First day of July.

Q. What effect did the holding up on that payment have n the carrying out of these works?

A. It affected our prospects of being able to get the necessary unds.

Q. Prior to '02 when you made monetary arrangements, did any xpert come down and actually make plans: What did the com- any do looking to the future extension of its supply?

A. Well, sir, about the time I was first employed by the com- any as collecter, they bought a number of acres of land around he reservoir there for the purpose of impounding more water and o obtain privileges to increase the supply generally.

Q. You mean privileges to back water on more land—on ad- oining land?

A. Yes, sir.

The MASTER: Didn't you go over that in your direct examina- ion?

Mr. WIMBERLY: No, sir.

Q. What spring is that over there?

A. What is known as the Stewart Spring.

Q. Where is that spring located?

A. I have never been to the spring myself. It is north east of the upper reservoir, according to my idea about it.

Q. It is near there?

A. Yes, sir.

Q. You know how it flows?

A. It flows through this land we bought, there being a hill between the reservoir and this stream near the reservoir. They had figured on conveying this water there by means of laying a pipe there, or else building a reservoir on this land we bought and raise it to a proper height and make it flow by gravity into the lower reservoir.

Q. As it now stands does it flow into the stream above or below the reservoir?

A. Below.

Q. So by piping it above it would add that much to the supply of the reservoir?

A. Yes, sir.

Q. Do you know what size stream that is?

A. Yes, sir; ordinarily it would flow about 400 or 500 gallons a minute. That is based upon my having seen the stream. I have never measured it.

Q. That much a minute?

A. Yes, sir.

Q. That would be some 700,000 gallons a day?

A. Yes, sir; in ordinary stage of it.

Q. You speak of plans for laying out another reservoir to bring

this high enough: under the plans what number of gallons would the reservoir hold, do you remember, additional?

A. Mr. Leddeaux walked over the ground with me and he said, rough estimate, he would place it at 100,000,000 gallons; although the engineer that laid it out claimed 400 million.

Q. What time was it that Mr. Leddeaux was down here?

207 The MASTER: He said in May, 1902.

A. In May, 1902. That's the year it went dry.

Q. The year it went dry?

A. Yes, sir.

Q. No dispute about the year. Give the time of the year: What time in the year had it shown signs of going dry?

A. Well, sir, at the time Mr. Leddeaux was here, the upper reservoir was down about two feet.

Q. So at the time the upper reservoir—at the time Mr. Leddeaux was here the upper reservoir had not failed at all?

A. No, sir.

Q. And the lower reservoir?

A. Was full.

Q. At the time you speak of the holding up of this payment that broke up these plans, had the water entirely failed in the reservoir?

A. No, sir; not entirely.

Q. Still water on hand at that time?

A. Yes, sir.

Q. You speak of the precautions, the man employed to keep the water pure over there, will you explain what effect having two reservoirs, an upper and lower reservoir and drawing water from the lower reservoir, has on keeping the water supply to the city pure?

A. Nearly all water works systems have a settling basin or reservoir. It is absolutely — to have a place to settle the muddy water.

208 Q. What is the purpose of that upper reservoir?

A. To settle the water so as to keep the muddy water out of the distributing reservoir.

Q. From the upper reservoir how does the water get into the lower reservoir?

A. We have a water gate and a pipe leading from that gate into the lower reservoir.

Q. That water gate takes the water from what part of the upper reservoir?

A. Flows from the top of it into the by-pass; and that gate is constructed in the side of the by-pass.

Objected to as not being in rebuttal and objection overruled.

Q. In the settling basin, where does the mud go?

A. To the bottom of the basin.

Q. So where you draw it at the gate from the top: You say this gate is at the top, what sort of water do you get?

A. The water flows over the side of the wier of the dam into the

by-pass and the gate which opens into this pipe is in the side of the by-pass.

Q. Here's what I want to get at: the effect of having that gate at the top of the water and the mud going to the bottom, gives you what kind of water?

A. To take the water from the top gives the clearest water.

Q. You were asked about the time the water nearly failed in 1895, you said something about catching fish, I believe: I will ask you this: before there was any reservoir there at all and dam built, was there a stream there?

209 A. O, yes, sir.

Q. When you speak of the reservoir failing, had the stream itself dried up?

A. Not entirely.

Q. There was a running stream all the time?

A. Yes, sir.

Q. Running through the upper reservoir?

A. Yes, sir.

Q. And through——

A. Into the lower.

Q. That stream never had failed?

A. No, sir; not at all—never has failed entirely.

Q. In '02 when you speak of the water getting out of the reservoir and the water getting so low that the city condemned it, did the stream itself entirely dry up?

A. Not entirely. The amount was so small it did not amount to much.

Q. These other streams that he asked you about if they failed: Did the dry weather affect all the streams around Columbus?

A. Well, sir, the dinner toters walked across the Chattahoochee River up there by the railroad bridge; and nearly every stream in the country, if it did not dry up entirely, got very low, I believe, that I heard of.

Q. The Chattahoochee is a stream that is ordinarily navigable to Columbus, isn't it?

A. Yes, sir.

Q. A good, big stream: Boats come up to Columbus?

A. Yes, sir.

210 Q. Run regular schedules, don't they?

A. Yes, sir.

Q. I believe you said something about the drought being comparatively local: there were rains in the upper part of the Chattahoochee River?

A. Yes, sir; small showers, comparatively.

Q. They had rains on the small streams above that run into it?

A. Yes, sir; the Mulberry and Standing Boy Creek didn't dry up entirely; and their water shed is from a district of red hills which caused the water to be very muddy.

Q. You say Roaring Creek and Standing Boy are muddy streams?

A. Yes, sir; especially in rainy weather.

Q. How about Roaring Creek during this dry spell?

A. It didn't dry up entirely. It got very low.

Q. At the time of that drought, what stream is there around Columbus, stream or streams, taking them all in, that would have furnished an abundant supply of pure water?

A. Well, sir, I don't know of any of my own knowledge, near by.

Q. I mean near Columbus?

A. Yes, sir.

Q. At the time of these dry spells I believe you testified that stagnant water would not be fit to drink: At the time of these different dry spells, was there running water at all times coming in?

A. Yes, sir.

211 Q. I will ask you whether in any of these dry spells, prior to the failure of the reservoir in 1902, whether the quantity of water that the citizens was furnished was ever curtailed or lessened?

A. No, sir.

Q. There was a supply each day—same quantity in the pipes?

A. Yes, sir.

Q. The pipes never got empty?

A. No, sir.

Q. When you speak of the streams partially failing, the effect of that was, I suppose, that the daily quantity used came to be greater than the quantity going in?

A. Yes, sir.

Q. So each day——

A. Decreased the supply in the reservoir.

Q. The reservoir was decreased?

A. Yes, sir.

Q. Decreased the amount that the daily consumption exceeded the quantity that the stream brought?

A. Yes, sir.

Q. I believe you told Mr. Wimbish, taking in the amount or the number of miles of pipe that the present system has, it is something over 1/5th larger than 1895: How does the general average of size of pipes compare now with what it was in '95?

A. It has been increased by laying nothing less than six inch mains.

Q. What effect has that had on the average size of the pipes?

A. You mean as to the whole city?

212 Q. Taking it altogether: Has it raised the average of the pipes?

A. It has increased the average, yes, sir.

Q. You say during that time there has been no increase, practically, in the consumption?

A. Legitimate consumption. The legitimate consumption has increased.

Q. The actual quantity used is about the same now as in '95, the number of gallons per day?

A. There is more water legitimately used than there was.

Q. Less waste?

A. Yes, sir.

Q. How does the total quantity that is used in the city, pumped in and consumed in one way and another, how does it compare now with what it was in '95?

A. In my opinion there is very little difference. I know very well the waste we have checked from year to year.

Q. You speak of having removed several dead ends by running these connections and making a circuit: Have you increased the number of dead ends?

A. We have put in one since the receiver took charge, from Broad to Front Street, at the Brewery.

Q. How long is that?

A. About 450 feet.

Q. Short side of a block?

A. Yes, sir.

Objected to by the respondents as not being in rebuttal. Objection overruled.

213 Q. How do the dead ends now, both in length and number, compare with what they were in '95?

A. In the lower part of the city?

Q. I am speaking about the lower city?

A. Virtually speaking no difference—there has been no increase in the dead ends: I would say there is a great difference too: in '95 we connected up two dead ends and later we connected up three others. So there are about four dead ends less.

Q. Four less in number?

A. Yes, sir.

Q. Those four how do they compare in length, the dead ends, from the nearest circuit with what they were before they were connected up, is the distance here (referring to map) greater or less?

A. The distance is less.

Q. The circuit then has not only diminished the number of dead ends, but the length of the dead ends, is that right?

A. Yes, sir.

The MASTER: Don't lead him, Mr. Wimberly.

Q. In comparing the system at this time with what it was in '95, the effect of the greater pressure from Rose Hill standpipe, how does it affect the general efficiency of the system and the quantity of water it can deliver and the pressure under which it can deliver it, compared with what was the case in '95?

A. Well, sir, it about doubles the capacity of the system.

214 Q. Under greater pressure does more water go through the same size of pipe?

A. Yes, sir.

Recross-examination.

(By Mr. MARTIN:)

Q. You say at the present time the efficiency of the system is very much better than it was in '95?

A. Yes, sir.

Q. Who brought about that improvement?
A. Who brought it about?
Q. Yes?
A. The Receiver.
Q. That's what I thought. You say in cases of very low water supply, that there is as much water used in the city as there was before?
A. I think there is a little more on account of the dry weather the sprinkling of the streets.
Q. Isn't it a fact that when the pressure is very low that they can't use as much water in sprinkling streets and lawns as when the pressure is better?
A. They can but they have to take a little more time.
Q. The hose won't throw it as far?
A. No, sir.
Q. Therefore you can't water as much ground?
A. It takes more time to do the same work.
Q. The question was asked you by Mr. Wimberly as to the flushing of sewers: That is done by the city authorities?
A. Yes sir.
215 Q. Isn't there an agreement between the city and the water works people with reference to that?
A. I believe they pay us 40 cents per hour.
Q. They get pay for it?
A. Yes, sir.
Q. The city is not doing it without any authority?
A. No, sir.
Q. Hasn't it always been done at night?
A. Yes, sir.
Q. At times when there is less consumption of water?
A. Not at times when there is less. They usually do their flushing after the day is over, up to about nine or ten o'clock at night.
Q. Isn't it a fact that there is less consumption of water by consumers during that time than in the middle of the day?
A. No, the consumption of water about first — night is about equal to any other part of the time of the day, from the fact that they use water to wash dishes, bathing and for other purposes.
Q. How do you know at the time you were making this test on 6-h Avenue in 1900, that the Southern Ry. was taking water into an engine?
A. I saw them; and others present saw them.
Q. You know that then of your own knowledge?
A. Yes, sir.
Q. When did you say the city refused payment in 1902?
A. First day of July, 1902. It was the year that the water works went dry.
216 Q. Didn't you state on yesterday that it was for the quarter beginning in July and that they always paid after the water was furnished and therefore it was the first of October?
A. I would like to explain: I don't remember testifying in regard to the payment of any bill at all this morning. I think the evidence

given by the Treasurer is confused with mine. I presented a bill in July myself, which was for the months of April, May and June. That bill was held up until October. Mr. Chappell paid us the bill for April, May and June and says: "I will hold up this bill for July, August and September," because that was the time in which we were furnishing river water.

Q. Mr. Wimberly got you to explain a little while ago about the water going into the lower from the upper reservoir. I understood you to say that the water let into the lower reservoir for use is through the by-pass?

A. Yes, sir; when the reservoir is full.

Q. That's from the by-pass?

A. Or as long as it is within six feet of full.

Q. When it gets below that six feet how do you let it in?

A. We have three gates constructed in the middle of the dam. The gate in the middle remains down to the ground. The gate next to the water is opened up; and the water flows over the top of the middle gate and out under the third gate.

Q. You never open that lower one at all: What's the use
217 of that lower one at all, the one at the bottom?

A. That's to be used if you want to empty the reservoir or we used it when the reservoir got to where we could not get water around that by-pass.

Q. When the water is at its lowest in the upper reservoir that's the time it is most impure?

A. Yes, sir.

Q. During those times you have to get it from the lower one?

A. Yes, sir; we draw it through the gates in the middle of the dam.

Q. When the water gets low in the upper reservoir, is it not a fact that there is a good deal of area that is covered with mud that is left exposed to the rays of the sun?

A. Yes, sir.

Q. Suppose when the area is covered there is a good deal of vegetable matter in it, is there not?

A. Yes, sir; we spent in '92 nearly a thousand dollars to keep the grass cut.

Q. In '92?

A. No, sir; in 1902, I should have said, when it went dry.

Q. How much did you spend in these other years?

A. Well, sir; the droughts in the other years generally came in the Fall and there was very little grass that would grow; and there was very little money spent; and the droughts were not so long.

Q. There would be vegetable matter?

A. No, sir; it was kept removed if there was any.

218 Q. Kept removed?

A. Yes, sir; growing up in there.

Q. When that large area was covered with mud and this vegetable matter, suppose there came a hard rain, would it not wash right into the reservoir?

A. We hauled it out.

Q. Hauled what? Hauled out the mud?

A. Hauled out the vegetation and this grass.

Q. Well, the other part that had been baking there in the sun, and there came a hard rain wouldn't it wash right into the water?

A. It would into the water of the upper reservoir in case of a rain, though we ceased using from the upper reservoir, only used what was in the lower reservoir until we could get that settled to a certain degree, any way.

Q. But that same water would finally go into the lower reservoir?

A. Yes sir; after it would settle, that is, in case of a rain. During a drought that don't amount to nothing only fill the upper reservoir.

Q. You mean to say that the upper reservoir is not regarded as a storage reservoir?

A. Yes, sir; storage supply reservoir. That is the main purpose of the reservoir.

Q. Do you know when it was built?

A. I don't know exactly. It was there the first time I ever went there.

Q. There never has been any effort made to remove these thin edges by having marginal depths?

A. Yes, sir; we bought several hundred dollars' worth of lumber from W. T. Rutledge, Crawford, Alabama; and the lumber
219 was delivered but for the lack of means we were unable to complete the work.

Q. When was that?

A. Shortly after '95. I don't remember the date exactly. I can get it from our books.

Q. You didn't use it?

A. No, sir; not for that purpose; but some of the lumber is piled up there now.

Q. Did the water works company, during the time of your connection with it, ever use any river water to supply the mains except during the time intervening between the washing away of that submerged main and the stringing of the pipe around over the railroad bridge?

A. None, except during March when the bridge washed away and during the summer when the reservoir went dry—not a drop.

Q. You never used any prior to that?

A. No, sir.

Q. When this submerged main broke, I understood you to say it was perhaps 8 or 10 hours before you got the water stopped from running out?

A. Yes, sir.

Q. After that time then did you use any more river water—any more water from the reservoir until you got this circuit completed?

A. No, sir.

Q. Then the reservoir filled up?

A. The reservoir was full. We just had a freshet and nearly everything washed away over there.

Q. You got that completed, you say, about the middle of April?

A. No, sir; in 30 days from the date the bridge washed
220 away, which was the first of April.

Q. By the first of June or the last of June that supply had entirely failed?

A. Not entirely. In July I was over there myself to look after the way in which these gates in the dam had been opened and the upper reservoir still had considerable water in it, in July. It was after the 4th of July because we had a barbecue out home on the 4th of July; and Dr. Wiley, Mr. Reid and several other gentlemen were having a barbecue over there the day I went to look after these gates; so I know it was after the 4th of July when we had water in the upper reservoir—considerable water.

Q. What do you call considerable?

A. Well, sir, about six feet deep at the dam; and backed out some 200 feet.

Q. Two hundred feet?

A. Yes, sir.

Q. Still that would leave a good many acres of ground that had no water on it?

A. Yes, sir.

Q. When did you cease to use the water?

A. We ceased to use the water when it became foul and the Sanitary Inspector and some of the city authorities condemned it.

Q. Wasn't it foul here when it was only about——

A. Not to the extent as to make it unfit for use.

Q. What do you term water unfit for use?

A. Well, sir——

Q. What state does it get into when you say it is unfit to use?

221 A. The only way I have to tell is when it stinks.

Q. Did it stink?

A. It did when they condemned it.

Q. Didn't it stink, before?

A. I suppose it did, 10 days may- or longer before they took those steps.

Q. You still furnished it along?

A. We didn't know of any better that we could get.

Q. You found out better after they condemned it, did you not?

A. No, sir; don't know that we did.

Q. You think river water was no better?

A. In my opinion it was not but little better. It did not stink, that's the only difference.

Q. Mr. Preer, I believe you answered in reply to a question asked you by Mr. Wimberly, that the opening of these hydrants for fire purposes and for the flushing of sewers, would take out all the sediment in the pipes?

A. I didn't say that. It would have the same effect as opening the hydrants to flush the mains.

Q. Didn't you, in answer to his question, in which he stated "it would do it entirely;" and didn't you answer yes?

A. I don't remember that I answered such a question that way.

Mr. WIMBERLY: I never used the word entirely.

The MASTER: Let's get what the witness meant by it.

Q. I will ask you the question if that would have the
222 effect of removing it entirely.

A. Well, sir, as to whether it would remove it entirely, of course I can't tell except where I could see inside of the pipe. Since we have flushed every hydrant in the city, the pipes are clean and the only time, in my recollection, that they have not had sediment in the bottom of them. There may be pipes in the city that has it in it now, I can't tell; but I have done everything in my power to free it from any.

Q. Mr. Preer, the increased capacity of the pumps that you referred to as having been put in this system, that was done by the Receiver, wasn't it?

A. Yes, sir.

Q. Couldn't the water *work*s company have done it themselves before?

Q. No, sir; except to install the first pumping machinery.

Q. Why didn't they do what the Receiver has done?

A. Didn't have the money.

Q. It was necessary to be done, wasn't it?

A. Yes, sir; it appeared so.

Q. What the Receiver has done was necessary to have done.

A. Yes, sir; to meet the demands of modern times. The people want filtered water and more pressure.

Q. It was never done except under the order of the court?

A. No, sir.

Q. You say re-enforcement of this system was done prior to what the receiver did: Did you do anything except to build that standpipe and put in those pumps?

223 A. There were some mains laid in the lower part of the city that connected up those dead ends that I spoke of.

Q. Mr. Preer, when was this purchase made which included the Stewart Branch or Spring?

A. I think that was made about 1892. I may miss it six months or a year. I can't tell exactly—way back there.

Q. There were never any steps taken to develop it?

A. Yes, sir; they spent some money over there cleaning out.

Q. They didn't develop it, did they?

A. Not to the extent that they could obtain the water into our reservoirs.

Q. Was it practical?

A. Yes, sir; it was practical.

Q. Then why didn't they do it?

A. Well, sir, the amount of water obtainable from that spring would not amount to very much except in dry weather. These droughts came along every two years, you might say, the distance of time between them was considerable; and since I have been with the water works company I don't remember a time that they have had much money over and above their expenses, if any.

Q. Wasn't it for the want of money?

A. Yes, sir.

Q. Didn't you state awhile ago that the capacity of that spring, in ordinary times, would produce 700,000 gallons per day?

A. No, sir; I said 400 or 500 gallons a minute. I have not figured it out.

224 Q. 500 gallons a minute would be how many gallons—it would be 30,000 gallons an hour?

A. Yes, sir.

Q. And 24 times that would be 720,000 gallons in 24 hours: It had that capacity?

A. Yes, sir.

Q. By erecting a dam, according to some engineer's idea, it would create a storage reservoir of about 400,000,000 and according to Mr. Leddeaux about one hundred million?

A. Yes, sir.

Q. Wouldn't increasing it even one hundred million and with a natural supply of 700,000, that would have been an ample supply of water?

A. Yes, sir.

Q. You would not use very much more than that: You were not using very much more than that at that time?

A. Yes, sir; using about as much water then as now. Very little difference.

Q. Lacked three hundred thousand gallons of being a million?

A. Well, sir, I had no means of telling how much was there. An expert can figure how much water flows through a pipe, that is, what it will be under a certain head and given pressure down near where the water is drawn; but whether they can get at it accurately I don't know.

Q. I am asking you what you know. You are a practical man, if they had built that reservoir: Do they own the land?

A. Yes, sir; own it now.

Q. If they had built that reservoir isn't it a fact that they would have had an ample supply of water all the time?

A. I have always thought that——

225 Q. (Interrupting.) A. Answer that question: wouldn't they have had an ample supply all the time?

A. Yes, sir; they would have had.

Q. Then that's a fact?

A. Except in cases of drought like we did have. In case of a drought such as we had in 1902, I believe the water would have become stagnant. We would have had plenty of water but it would not have been any good unless it was good water.

Q. If it had been filtered it would have been good?

A. When it gets in that state I don't think it is good after it is filtered. Don't think it would be. Don't think you can filter the scent out of it.

Q. You would have had 100,000,000 gallons more of water to have started with in a drought?

A. Yes, sir.

Q. That will last sometime, won't it?
A. Yes, sir.
Q. Then as a matter of fact the scarcity of water in 1902 and in 1895 was not due to the unusual drought, was it: Wasn't it due to the fact that they did not build that dam for that supply of water?
A. If that dam had been erected we would have had more water to have drawn upon during the drought.
Q. Isn't that the object of an impounding reservoir?
A. Yes, sir; to store water.
Q. So you would have had that to have drawn from?
A. Yes, sir.

226 (By Mr. WIMBERLY:)

Q. This 700,000 gallons of water from Stewart Spring that you speak of, that in ordinary times or dry season?
A. I mean by that when the stream is flowing its best. Not during a freshet.
Q. Such a drought as you had in 1902, did that affect the Stewart Spring like it did the other?
A. Yes, sir; we could not obtain 50 gallons per minute out of that branch during that drought, that is, the last of the drought.
The MASTER: You mean to say in your estimate of 500 gallons per minute as the flow of Stewart Spring, that the normal flow in ordinary times?
A. Yes, sir.
Q. You were speaking about the re-enforcements by the receiver, which you have already specified: How much of that was during the receivership and how much prior to the receivership?
A. No, sir; I don't think I specified what has been done since the receiver took charge.
Q. You specified, I believe, fully what was done before the receiver in detail?
A. Yes, sir.
Q. What improvements you were speaking of by the receiver were in addition to those you have specified?
A. Yes, sir.
Q. All those you testified to were before the receiver?
A. Yes, sir.

(By Mr. MARTIN:)

Q. Don't you gather the water in a large impounding reservoir at times during normal flow, isn't that a fact?
227 A. I don't understand exactly.
Q. You stated that the Stewart Spring at its normal stage had a capacity of 500 gallons per minute or 720,000 gallons in 24 hours: If you had had this other reservoir you would fill that up, the Stewart Branch Reservoir, during normal times, wouldn't you?
A. Yes, sir.
Q. It would not have run dry, would it, entirely during '02?
A. No, sir; a certain amount of water is lost by evaporation.

Q. Well, approximate how long?

A. I think Mr. Preer could testify to that better than I can.

Q. Well, what I want to get at is this: Did you act with promptness in the matter?

A. Just as prompt as we possibly could.

Q. To get them in as soon as possible?

A. As soon as possible, yes. Could not have been done by anybody else any quicker.

Q. During the time you were making that change was the city without water except the few hours you speak of?

A. Plenty of water from the river.

Q. You had to use river water?

A. Yes, sir; had to use river water.

Q. You say that change around by the Central Railroad bridge, besides the additional angles, you had to increase the length of your pipe lines?

A. Yes, sir; a good deal.

Q. Did you have the pipe on hand for that increased length or did you have to order it?

A. Didn't have enough. Ordered some of it.

Q. After that water was brought around over the Central Railroad bridge, how long was it before there was any failure of supply of water from your reservoirs?

A. It didn't take any time at all.

Q. What say?

A. It didn't take any time.

258 Q. What I mean is after that did you have any dry spell?

A. Yes, sir; had a very severe drought.

Q. What time was that, do you remember?

A. It would not be possible for me to give you the dates or the time.

Q. Was it the same year you had the accident?

A. O, yes.

Q. How did that drought compare in severity with previous droughts?

A. We had never had any such drought as that before.

Q. How long have you been living in and about Columbus?

A. Sixty three years, I think.

Q. Living in the city all that time?

A. Yes, sir.

Q. Within 63 years, taking the different droughts you have had, how would this drought compare in severity with the others?

A. I don't recollect anything like this before.

Q. Was its effect felt only on the stream of water from which you get your water from or on all the streams about Columbus?

A. I think it affected nearly all the streams.

Q. The unprecedented drought you speak of, what was the result of that on your water supply?

A. We had none. Could not get any water from the reservoirs at that time.

Q. How long after the drought set in before the water in the reservoir failed—about how long?

A. I think it was a very short time; but I can't give you
259 the dates.

Q. When the company found that there might be a failure, did the company start to take any steps to change its source of supply or guard against such things?

A. I really don't know.

Q. What money arrangements did you make: You looked after that yourself?

A. Yes; but at the same time I was just out of my bed. I had been sick for nearly a year. Laid up for sometime.

Q. You yourself was personally laid up at the time?

A. I think Mr. Garrard did.

Q. Mr. Garrard looked after that at that time?

A. Principally in charge at that time.

Q. What connection had Mr. Garrard with the company?

A. He was a director and large stockholder.

Q. He took that matter in charge?

A. He had a majority of the stock.

Q. Do you know what he did; where he went or what he undertook to do?

A. I think he can tell you himself better than I can.

Q. Mr. Garrard being an attorney in the case we don't care to make a witness out of him: You can state as far as your knowledge goes. What your knowledge don't extend to we will try to prove by others: Where did he go and what arrangements did he undertake, do you know?

A. I don't know whether it was exactly at that time. After the drought commenced—after that culminated or soon after, I
260 know he went to Baltimore to see these parties interested and there tried to arrange for it. An engineer was sent out to look at what could be done, Mr. Leddeaux.

Q. All that was done by the company: Who was Mr. Leddeaux?

A. He was the engineer of the American Pipe Company. I think they own a number of water works plants or systems in the United States.

Q. Did Mr. Leddeaux come down here?

A. He did.

Q. Did he make estimates and devise plans?

A. I think not. I think he went back and reported to his company what he found.

Q. Do you know what it was that contemplated—Do you know what it was that prevented these contemplated improvements from being made or carried out?

A. The scarcity of money.

Q. From what source did you expect or plan to raise the money?

A. The selling of bonds.

Q. What prevented the sale of bonds?

A. People would not buy them because the city was going to build a separate system and destroy ours.

Q. Is that the reason the bonds were not sold—that the water works company didn't make these changes?

A. Yes, sir; they could not be sold. People didn't want them.

Q. But for the city's action in refusing payments and announcing that they would build a system of their own——

Objected to as leading; and that the witness has not stated
261 anything about the city's refusing payments.

Mr. WIMBERLY: I thought in the interest of economy of time that I would not ask the witness about facts that there was no dispute about. There is no dispute about the fact that the city did refuse payment.

Mr. MARTIN: He didn't state that was the reason why he didn't sell the bonds. He said the city determining to build its own works.

The MASTER: Judge Martin objects, as I understand it, to your reference to a matter that has not been brought out by this witness.

Mr. WIMBERLY: That's true. I didn't ask him about it because it is in the record.

Q. You speak of the city's planning to build its own water works: What was the first step the city took in that direction?

A. They passed an ordinance to build water works of their own and issue bonds.

Q. Before they passed the ordinance to build water works, what did they do with reference to refusing payment?

A. It seems to me that was done afterwards.

Q. You think that might have been done afterwards?

A. I think that was done afterwards.

Q. All along about the same time, was it?

A. Yes, all during that time.

Q. This refusal to pay, was that published in the papers, or do you remember about their refusing to pay rental?

262 A. I think it was but I don't recollect it.

Mr. MARTIN: I submit to the court that there is a better way of proving that.

The MASTER: Yes.

Mr. WIMBERLY: We will put in the papers.

Q. Mr. Epping, what was the effect of all these acts by the city on the company's plans to sell its bonds and make these improvements?

A. It destroyed our credit so we could not sell our bonds. That's about all.

Q. How many bonds had you in your hands at that time to utilize?

A. We issued $500,000. of bonds.

Q. You had disposed of how many up to that time?

A. We had disposed of—I know we had over $100,000. of bonds on hand.

Q. You had over $100,000. dollars of bonds on hand at that time?

A. Yes, sir; all signed and ready to deliver.

Q. Would that have been sufficient to have made such improvements as to have given the city ample water supply?

A. O, yes. Certainly that was enough.

Q. Do you remember what Mr. Leddeaux's estimate was—as to how many dollars?

A. No, I don't remember that.

Q. You don't remember that?

A. No, sir.

Q. Was it more or less than the amount of bonds you had
263 on hand?

A. Less.

Q. What was that Mr. Leddeaux planned to put in?

A. I can't tell you that. I don't know.

Q. Don't you know in a general way what items were included?

A. No, sir; I was not with him. I was too unwell to go off with him.

Q. These proposed plans, who were they turned over to, do you know?

A. Which plans?

Q. Mr. Leddeaux's plans?

A. I don't think he made any.

Q. Didn't complete his plans?

A. I don't think he did. I never saw any.

Q. What was it the water works company contemplated doing, in a general way, without going into particulars, what was it in a general way you proposed to do to strengthen the system?

A. Another engineer came out here who made plans for an additional reservoir—larger reservoir.

Q. Much larger reservoir?

A. Yes, sir.

Q. I will ask you whether or not a filter plant was among the things contemplated?

A. No, I don't think we needed any filter at that time.

Q. A larger reservoir is what you had under consideration?

A. Yes, sir.

264 Q. Where was that reservoir to be?

A. South of the present reservoir.

Q. On the same side of the river?

A. Southeast.

Q. What stream or streams were to be utilized?

A. The present Holland's Creek was one and the Stewart Spring or Branch, two branches from Summerville there, Bradford Spring and McElvey. We bought the McElvey place also.

Q. These additional streams that you have given in a general way, were they on land that the company had on hand or acquired for that purpose?

A. No, the McElvey was not.

Q. What about the other, the Stewart Spring?

A. We bought 200 acres from McElvey.

Q. When was that purchase made?

A. Probably a year or two before this accident took place.

Q. What about the Stewart Spring?

A. That had been purchased very soon after we took charge of it.

Q. In 1902, when you were planning to put in these additional

reservoirs, did the company at that time own any land or water privileges for that purpose?

A. Yes, sir.

Q. It owned them?

A. Yes—no, in order to back water on the McElvey place, we had to back water—that's the reason we bought the McElvey place. We had to back water on it and had to buy it.

265 Q. How is that?

A. We had to buy that place.

Q. Did you buy it?

A. We bought it.

Q. Did you buy it before 1902?

A. Yes, sir.

Q. I mean in 1902 after you bought the McElvey place, did you have all the ground that was necessary?

A. Yes, sir; we had the ground.

Q. That's what I mean, in 1902?

A. Yes, sir.

Q. What was to be the capacity of the additional reservoir?

A. Mr. Yocum claimed that it would hold 400,000,000 gallons.

Q. Who was Yocum?

A. Yocum was an engineer from New Jersey. He had been an engineer for the old company.

Q. Who sent Mr. Yocum down here?

A. We sent for him. We asked him to come down here.

Q. Did you employ him?

A. Yes, sir.

Q. For what purpose?

A. For the purpose of looking into this other reservoir.

Q. Did Mr. Yocum come down here before or after Mr. Leddeaux?

A. Sometime before. Year or two before.

Q. Do you remember the year?

A. When Yocum was here?

Q. Yes?

A. I think it must have been in '98 or '99.

Q. Was it before the pumping station had been put in?

A. O, yes, sir.

Q. Mr. Leddeaux, when he came down here, were you well enough to see what he looked after, in a general way—what he was expected to form plans for, or did some one else take that up with him?

266 A. No, I never went out with him.

Q. You never yourself?

A. No.

Q. Did you have any communication with him?

A. Only an introduction. I saw him once or twice.

Q. Who had the matter in charge for the company at that time?

A. I think Mr. Garrard.

Q. What was it that was contemplated at that time in the way of enlarging the works when Mr. Leddeaux was here?

A. To make a larger reservoir.

Q. On the other side of the river?

A. Yes, sir.

Q. Substantially the same place Mr. Yocum had planned?

A. Then we wanted to preserve the gravity system. So much less expense in a gravity system than there is in pumping.

Q. Do you remember how much that would have added to the capacity according to Mr. Leddeaux's estimates?

Mr. MARTIN: I understood him to say that Mr. Leddeaux didn't make any estimate.

Mr. WIMBERLY: He said he didn't make any plans.

The MASTER: Did he make any estimates that you know of?

A. I don't think he did.

Q. How long was Mr. Leddeaux down here?

A. I don't know how long he remained here even. I don't know how long he remained here.

Q. Was it before or after the city refused payments and began to plan water works of its own?

A. I think it was before.

267 Q. Was it a short time before or sometime before?

A. Not that I know of. I can't tell you.

Q. Fix it this way: Had Mr. Garrard gotten back? You say he went east?

A. Yes.

Q. Had Mr. Garrard gotten back or not at the time the city refused, or do you remember?

A. I think not.

Q. Do you know whether Mr. Chappell, the Mayor, was requested to hold this matter up until Mr. Garrard could get back?

A. No, I think not.

Q. You did not yourself: You were not the one that saw him?

A. No, sir.

Q. Mr. Epping, you say you can't fix the date when the drought occurred, the month or time?

A. It was in the summer of 1902.

Q. How long was it before July 1, 1902?

A. I can't tell you how long it was exactly.

Q. Just in a general way, can you describe about how the ground was here, whether it was dry and how deep it was dry—the dry soil extended?

A. They said it was dry 15 feet down.

Objected to what "they said."

The MASTER: Just what you know: Do you know that it was dry that deep?

A. No, no, I don't. I didn't dig down to see.

Q. You did not yourself dig down?

A. No, no.

The MASTER: What others said would not be admissible.

Q. How about the river: did the river keep up its ordinary size or did it become low?

A. The river became very low.

Q. Mr. Epping, up to the time of that drought in the
268 Summer of 1902, had your water supply ever failed?
A. No, not entirely.
Q. Had there been any time when the company had failed to furnish to the town and its inhabitants water except at the time the submerged main broke?
A. No, I think not.
Q. These reservoirs over in Alabama; when you took charge in 1891 were both reservoirs there?
A. Yes, sir.
Q. Both had been built prior to that time?
A. Yes, sir.
Q. You say you have been a resident of Columbus for about 63 years: do you know from your general knowledge and acquaintance the years in which these reservoirs were built and which was built first, the upper or the lower?
A. The little one was built first.
Q. The smaller one is the lower?
A. The little one was built——
Q. (Interrupting.) You mean by the little one the lower reservoir?
A. Yes, number one.
Q. And the one you call No. 1?
A. Yes, sir.
Q. The upper reservoir, what time was that put in, can you fix that?
A. No, I can't fix it. I don't know exactly the date; but it was done sometime afterwards, probably a year or two afterwards.
Q. About how long was it before you took charge in 1891 that the upper reservoir was built—How long before that?
269 A. I think it was built in '89—about '88.
Q. For what purpose was it built, the upper reservoir?
A. It was done before then.
Q. Before '89?
A. Yes, sir.
Q. Can you fix the date more definitely than that?
A. No, I can't. I had nothing to do with it then.
Q. What was the purpose in building the upper reservoir?
Q. As I understand it they wanted a settling reservoir?
Q. Was that the purpose it was used for?
A. And to increase the water supply.
Q. To increase the storage as well?
A. O, yes.
Q. Explain what you mean by settling reservoir?
A. The water stands and the dirt and mud will settle to the bottom and leaves the clear water.
Q. And the clear water is drawn from what part of it?
A. From the upper part of it, of course.
Q. Where it settles the clear water is on top; and you draw it off from the top?
A. Yes, sir.

Q. The supply that was furnished to the city and its inhabitants was from what reservoir: From which of the two reservoirs did you take the water that came into the pipes for distribution into the city?

A. Came from the smaller reservoir.

The MASTER: That is what is known as the lower?

A. Yes, sir.

The MASTER: The lower reservoir?

A. Yes, sir; the lower reservoir. We had no connection with the upper reservoir at that time.

270 Q. What arrangement had you out there for the purpose of preventing any overflow from the upper into the lower reservoir: Had you any arrangement?

A. Yes, sir; there was a connection between the two that brought it around through the by-pass.

Q. What became of the overflow water, if there was any at any time, did it have to go over the dam?

A. It did at one time, not while we owned it but before that it had gone through the lower reservoir.

Q. What was the arrangement during the time you owned it, your present company?

A. We passed it through a pipe and from the pipe into the lower reservoir.

Q. Piped it?

A. Yes, sir.

Q. What became of the overflow water?

A. Went down through the by-pass.

Q. And down below the reservoir?

A. Yes, sir.

Q. What was the effect then of the by-pass, did it preserve the clearness and purity of the water in the lower reservoir?

A. Yes, sir; not to take any muddy water into the lower reservoir.

Q. That's what the by-pass accomplished?

A. Yes, sir.

Q. What sort of water had you then in the lower reservoir after this by-pass was constructed?

A. It was clear.

Q. Keeps it clear at all times?

A. O, yes, sir.

Q. How is the lower reservoir constructed, as to its sides and bottom?

271 A. It was constructed with a rock wall built around it.

Q. On all sides of it?

A. Yes, sir; on all sides of it.

Q. How is it at the bottom, mud or what kind?

A. No, it has a rock bottom and a number of springs in the sides and bottom.

Q. So with a rock bottom and rock wall sides, what protection has it against muddy water coming in from above: How is the water kept in the lower reservoir: What kind of water?

A. It is from springs.

Q. As to whether it is muddy, clear or how?
A. It was clear.
Q. These photographs that are in evidence, have you seen those?
A. I don't know whether I have or not.
Q. Do you know whether they are correct or not?
A. Yes, sir.
Q. These photographs do they correctly show how things are over there?
A. Yes, this one does (Referring to No. 1).
Q. I will ask you whether these are correct photographs.
A. Yes, sir.

Mr. WIMBERLY: Shall we tender them now?
The MASTER: This is not the proper time. You may tender them at the end of his testimony. Don't want to inject them in the middle of his testimony.

Q. I will ask you in a general way, with the exception of the time that you had to use river water, on account of the breaking of that submerged main, what was the character and quality of water
272 furnished by the Water Works Company to the city, from the time you took charge in 1891 up to the present time?
A. I think it was good.
Q. What was the character of the pressure, fire protection furnished?
A. It was not as good as it is now.
Q. Let's take it up by years: Did you yourself examine the gauge or is that a matter that we will have to get from the gauge records?
A. You can get it from the gauge records. When I was well enough to come I generally saw the gauge though, myself.
Q. What say?
A. I generally saw the gauge myself.
Q. What time was it that the city and water works company succeeded in getting together on the arrangement for supplying the annex?
A. I think the arrangement was made by Mr. Garrard. I can't tell you exactly.
Q. Prior to the time that arrangement was made: The arrangement you speak of, is that the ones that appears on the records of council?
A. Yes, sir.
Q. That will fix the date?
A. Yes, I suppose so.
Q. Prior to that time had the city ever made any arrangement with the water works company for supplying the annex?
A. No, they had not. We had filled the standpipe for that purpose—prepared for it in that way.
273 Q. How far had the water works company gone with its pipe prior to this arrangement, which I believe the record shows was 1899—whatever it is it is in the record—how far had water been put into the annex before this arrangement was entered into in '99—what streets, do you remember?

A. I think we had water as high as 18th or 19th Street somewhere.

Q. Above 19th street, the part you did not put in your water at all until this arrangement of '99, what was the character of the ground there as to elevation?

A. It was much higher than the city.

Q. So when you made your arrangement to put water in the annex, what change did it bring about in your method of furnishing water?

A. We had to pump the water up there.

Q. You changed then from a gravity system to a pumping system, did you?

A. Yes, sir.

Q. Was there any arrangement with the city prior to '99 as to taking any number of hydrants from you in the Annex?

A. No, not until that.

Q. Not until that time?

A. Until the agreement was made.

Q. Are you able to give from recollection what additional cost was required by reason of making these extensions into the annex?

A. No, the books will show it though.

Q. How was that money raised for making those extensions?

A. It was partly from collections from water rents.

274 Q. And the other part from what?

A. Part was borrowed in Baltimore.

The MASTER: Borrowed you mean on your bonds?

A. On the bonds.

Q. What do you mean by borrowing upon the bonds?

A. Had to borrow it and give bonds as security. Would not buy bonds.

Q. You used the bonds to raise the money?

A. Yes, sir.

Q. That expenditure was about what time?

A. The books will show that.

Q. The time is shown by the books?

A. Yes, sir.

Q. So that the company did about the time that is shown by council proceedings go to this large expense of erecting a standpipe, putting in a pumping system and running pipes all through the annex?

A. Yes, sir.

Q. What effect did that have, Mr. Epping, on the fire pressure that was given the city, the erection of the Rose Hill standpipe?

A. Gave a good deal more, of course.

Q. Increased the pressure?

A. Yes, increased the pressure a great deal.

Q. From and after the time the standpipe was erected, what has been the character of the fire pressure that the city has enjoyed?

A. I think the city was well satisfied with it. They were present when the test was made.

275 Q. Has there ever been any scarcity of water in the city until the break-down that you spoke of?

A. Not until this drought was and the bridge washed away.

Q. Prior to 1900 had there ever been any lack of a sufficient quantity of water?

A. No, I think not. I never heard of it.

Q. You could not give the date just now when these contemplated improvements of 1902 *were made:* I will let you refresh your recollection by looking at your affidavit: Refresh your recollection from that affidavit and see if you can give the date a little more definitely than you have given it.

The MASTER: This is the date of the standpipe in the Rose Hill Annex?

Mr. WIMBERLY: The improvements in 1902 that were contemplated: This was made when he had access to his records and books which he has not now.

WITNESS: Which date?

Q. I have reference to the time when you were having experts to come down or rather an expert to come down and figure on the matter of improvements—contemplated improvements; but you could not tell me how that date compared with July 1st: Can you refresh your recollection and state about when that was: Was it before or after July 1st?

A. (Witness reading affidavit.) I don't see it in here.

Q. Well was it before or after the stoppage of rental July 1st, you remember: I was trying to fix the date when Mr. Led-
276 deaux, the expert, was down here, as compared to the stoppage of rental on July 1st, 1902: Can you fix it with reference to that date: Was it before or after July 1st?

A. Mr. Leddeaux was down here before, I think.

Q. How long before? Are you able to fix it with any approximation?

A. No, I can not.

Q. Fix it this way: When Mr. Leddeaux was down here had Mr. Garrard already gone on to the North?

A. Yes, he was at the North when Mr. Leddeaux was down here.

Q. When the stoppage of rental occurred had he gotten back from the north or was he still in the North?

A. I don't recollect. I think Mr. Garrard had got back, though, about that time.

Q. You don't remember about that?

A. No.

Q. You didn't remember the proposed cost, without refreshing your recollection, just now?

Mr. MILLER: He said he did not.

Q. Can you re-call, approximately, about what those proposed changes were to cost?

A. O, yes, I can tell you that.

Q. How much?

A. It was not Mr. Leddeaux's estimate alone, however, we had al-

ready made out an estimate and sent it on to be shown to our friends in Baltimore.

277 Q. What was that amount?

A. About $90,000 or $95,000.

Q. Without going into specific details, can you just state to the court in a general way, about what that $90,000 covered—just in general terms, of course you can't go accurately into the estimate?

A. It covered considerable improvement in the reservoirs and filter plant besides.

Q. Mr. Epping, from the time you became President of the Company—I believe you say you were elected in '90 and took active physical charge in 1891?

A. Yes, sir.

Q. What formal complaints, if any, has the city of Columbus ever preferred as to the quality of the water? I mean by formal complaints, such as mentioned in paragraph 13 of the contract: What formal complaints of that sort has the City ever made?

A. I don't think they have made any. If they did I never saw them. If they ever made any to an officer I never saw them—if they ever made any officially I never saw them.

Q. Never made any officially that you recollect of?

A. None that I recollect of or heard of.

Q. You were the president and the proper man for them to be made to, all the time?

A. Yes, certainly.

Q. You were living here in Columbus the whole time?

A. O, yes.

278 Q. What notice did the city at any time give the company of the water supply becoming contaminated or unwholesome?

A. I don't think they give me any notice.

Q. I will ask you to state whether or not during that time the city has ever asked for the appointment of experts to determine the fact of contamination or unwholesomeness of the water?

A. No, sir.

Q. Never has?

A. No, sir; never gave me any such notice.

Q. The records that have been read in evidence show two bond elections called by the city, I believe, prior to 1900—two, I think the records will show—my recollection is that there were two: At the time of holding these elections had any agreement been reached as to supplying water to Rose Hill?

A. No, sir.

Q. What was it that led up to the holding of these elections, do you know?

A. I understood that they wanted municipal ownership.

Q. What claims did they make before the people as to whether the contract with your company was legal or illegal?

A. They claimed that it was not legal. They claimed that there was some deficiency—something had been omitted, I believe, that it had not been submitted to popular vote, something of that kind.

Q. Prior to the time the water was put into the annex, what was the cause of the dissatisfaction, if there was any?

279 A. I heard of complaint made by citizens that——

Q. Was the question of supplying water to the annex one of the questions?

A. No, I think not. I never heard of that.

Q. Prior to the time you made this arrangement in '99, what efforts, if any, had the water works made to try to get a fair arrangement with the city to supply the annex?

A. I don't think they made any.

Q. Had the city tried to make any with the Water Works Company?

A. No, sir.

Q. I will ask you whether before 1899—prior to 1900, your communications with the City Council, the council proceedings, do they represent correctly all that passed between the city and the water works company—everything that passed?

A. I believe so. I don't know. I have not seen them lately.

The MASTER: They speak for themselves. If the object of your question was to ascertain whether there was anything else, that's all right.

Mr. WIMBERLY: Yes, sir; they speak for themselves.

The MASTER: You asked if they correctly represented what passed between them.

Q. That everything that passed between the water works company and the city, that's what I mean?

The MASTER: Ask him if there was anything else?

280 Q. Was there anything else between the water works company and council in the way of complaints or attempted agreements except what occurred in these council proceedings and your letters to the council and communications with the committee?

A. I don't recollect anything else.

Q. Was the attention of the water works company ever called by the city to any defect, further than appears in these proceedings of council?

A. None that I know of.

Q. Whenever the attention of the water works company was ever called to any defect or complaint on the part of the city by these council committees, I will ask you what the company did?

A. The company certainly tried to satisfy everybody that they could.

Q. You say that the company had on hand more than $100,000. of bonds at the time you were planning to make these extensions in 1902: How long had the company had those bonds available?

A. They are on hand now, $108,000. now I think.

Q. How long have they been on hand?

A. From the time I signed them in Philadelphia.

Q. From the date of those bonds and the mortgage securing them, up to the present time, has the company had them at all times?

A. Yes, sir. They were left in the vault of the Mercantile Trust & Deposit Company at Baltimore after they were signed. They were signed in Philadelphia.

281 Q. How late has the company actually made sales of some of those bonds—I mean some of the same issue of those they now have on hand?

A. I don't believe I can give you the date. I don't know.

Q. Comparing it with the other dates when you put the pipe across the bridge and bought this other pipe, any sold then?

A. No, sir.

Q. When the Rose Hill extension was made in 1900, any sold at that time?

A. No, I think not. They were put up as security for a loan, I think.

Q. Mr. Epping, the resolutions of council and the proceedings of Council: I show you a letter from you to council—I mean from you as President of the Columbus Water Works Company to the special committee, letter dated August 7, 1894, in which you answer certain questions: I will let you look at that letter: this is a copy? (Handing witness document.)

Q. (After reading said document.) This is all right.

Q. I will ask you, having refreshed your recollection from that letter, do the statements in that letter give the facts as they then existed?

A. Yes, sir; that does give the facts.

Q. Those statements that you made in that letter, are they true?

A. Yes, sir.

282 Q. They take up each one of these communications: You wrote a number of letters, didn't you, as President of the Water Works Company?

A. Yes, sir.

Q. To the city?

A. Yes, sir.

Q. That are in the record: you have heard them read in court here; Were you here when they were read?

A. No, I don't think I was.

Q. You know about the letters that were written?

A. Certainly.

Q. I will ask you whether the facts you state in all those letters—in that correspondence are truthfully stated?

A. I certainly didn't tell a story about it.

Q. Mr. Epping, in this letter——

A. (Interrupting.) There was one mistake made and that was that the upper reservoir contained—was capable of holding so much more water than it really does: I didn't really know that. I didn't survey it and didn't have it surveyed myself. It was done by somebody else. I presume he did it correctly. He claims that it does not hold as much water as I said.

Q. So far as the quantity was concerned you got that from information?

A. I got my information from the old party—from the parties that formerly owned the system.

Q. At the time you made that statement you thought that was correct?

283 A. Yes, sir; I thought that was correct; but I find since that there was a mistake in it.

Q. In this letter that I have just asked you about, you gave as a reason that prevented you from making certain changes to strengthen this system, threats which were damaging to the company: What were the threat- that you referred to on the part of the city?

A. Threat that they would build a municipal system of their own—a water system of their own.

Q. These threats in the resolution about claiming that the contract was not valid because not submitted to a vote?

A. Yes, sir.

Q. I will call your attention to this resolution of council in these proceedings, at the time the water works company and the city were having this correspondence, the resolution passed at the same council meeting at which a letter was submitted from you, as President: In your letter—I will first show you your letter to bring it back to your mind: the letter you wrote the special committee in August, 1894, in which you suggested that some agreement be reached after due consideration, consultation and explanation on some equitable terms, and so on; and upon the submission of that letter to council, the same year—the same time, this resolution was passed: the adoption of the contract was not submitted to a vote of the qualified voters, be it resolved by the city council as follows: The said

284 contract of October 7, 1881 by and between the Mayor and City of Columbus and Thomas R. White, is hereby declared not to be legally binding upon the City of Columbus?

A. Yes, sir; they did that.

Q. After they passed that resolution, because it was not submitted to the popular vote the contract was not binding, what was the effect of that resolution and others of the same tenor, upon the ability of the Columbus Water Works Company to raise additional sums of money to make betterments and improvements in the system: what effect had that resolution?

A. It destroyed our credit. We could not sell our bonds to get money.

Q. Up to that time had you been able to sell your bonds?

A. O, yes.

Q. At what rate had you always been able to sell them up to that time?

A. Bonds were sold in the first place, I think, at 90. The brokers took them at 90.

Q. Had there ever been——

A. (Interrupting.) However, we had to pay $10,000. as earnest money, something of that kind.

The MASTER: Earnest money for what?

A. That we would complete the purchase and pay for the system.

Q. That you would apply the money to——

A. We had to put up $10,000. in cash to the committee that had the sale of the property.

285 Q. Of the bonds?

A. No, we had ten thousand dollars in money we put up. We had no bonds.

Q. Up to the time of this resolution I have read you, and the others on the same line, at the time of this council proceeding in which it denied the validity of the contract because it was not submitted to a popular *b*ote, had the company ever had any difficulty in selling its bonds?

A. No, not that I know of.

Q. You had on hand at that time, in addition to the $108,000., the other bonds you subsequently hypothecated, did you not, in 1900?

A. Yes, sir.

Q. Are you able to give now or by reference to your books, what amount of bonds you had on hand available in '95, when this resolution was passed—it was in '94?

The MASTER: The letter of Mr. Epping was dated August 7th.

Q. This is October 7, 1894: I asked you can you give what amount of bonds the company had on hand at that time: You say they have on hand now $108,000. and in 1900—about 1900, some years after this, you hypothecated some: how much did you have on hand in '94: Can you give it approximately?

A. No, I could not, unless I referred to the books. You can get it from the books as to how many they have sold.

286 Q. Do you know how many you hypothecated in 1900—about how many?

A. We borrowed money from a different Trust Company from the Mercantile Trust & Deposit Co. Mr. Willcox Brown was President of the company we borrowed money from.

Q. Do you remember approximately about how many they were?

A. How many bonds we put up?

Q. Yes, at that time?

A. No, sir; I do not.

Q. You say they never up to that had any difficulty in selling that same issue of bonds?

A. No, sir.

Q. Prior to this repudiation—up to '94 I mean?

A. No, we never had any trouble in selling bonds whenever we wanted to.

Q. About the time of this resolution and the time of the repudiation by this resolution in which they declared the contract was not binding, you referred in your letter to certain contemplated improvements towards strengthening the system over there at Stewart's Spring and increasing the reservoir and the city supply: had you these improvements actually in contemplation at the time that this resolution was passed?

A. Yes, sir. We even went so far as to take a lot of hands out there—I think we had 38 hands out there employed at one time to try to increase the flow of water from the spring and we found things out there entirely different from what we expected. Wasn't

287 near as much water as we expected to get from there.

Q. From the Stewart Spring you mean?
A. Yes, sir.
Q. When was that time, can you fix the date?
A. No, I can't fix the dates. They were the hands employed by the Columbus Railroad Co. and Mr. Flournoy and Mr. Garrard both went out with them. Mr. Daniel was in charge, I think.
Q. In your letter of August 7, 1894, you reported to council at a meeting immediately preceding this October meeting that you read just now, there were certain improvements that you referred to as being willing to make: What prevented you from making those improvements?
A. We were not asked to make the improvements. Mr. Chappell repeatedly stated that nothing but municipal ownership would satisfy him. No use making the improvements.
Q. This resolution that they would not be bound by the contract was passed before you had a chance to make any such improvements?
A. Yes, sir.
Q. What effect has that resolution and others like it, had upon the ability of the company to make contemplated improvements in its plant?
A. We could not get the money to make them.
Q. But for the passing of that resolution I will ask you whether there would have been improvements made that were not made?
A. I don't know that that was the only cause. Several
288 publications made in the newspapers injured our credit.
Q. You mean municipal ownership, things of that kind?
A. Yes, sir.
Q. All those collectively was the cause?
A. Yes, sir.
Q. This resolution was just part of it?
A. Yes, sir.
Q. I notice in these letters that you a number of times urged the city to try to come to some agreement and offered to do what was fair: could you ever get the city to do that—to come to any agreement?
A. Finally: there was an agreement made finally.
Q. In 1900. But from '94 were you able to get the city to specify definitely what it wanted and give you some assurance——
A. No, I think not.

Cross-examination.

(By Mr. Martin:)

Q. What time in '90 did you and the others purchase the stock of Mr. Archer and the other stockholders of the old company?
A. I think it was consummated in February, 1891.
Q. I am talking about when did you buy the stock?
A. We didn't buy the stock until we bought—at the same time they delivered the stock, they had agreed to cancel the bonds they had issued and give them up to us.

Q. What time in 1890 did you make a contract to purchase?

289 A. It was sometime in the Fall of '90.

Q. The Fall of '90?

A. They made us put up a certain amount of money to show that we were in earnest.

Q. Who were the purchasers?

A. It was Mr. Samuel Spencer, Mr. Louis Garrard, myself and Mr. Foley.

Q. You four?

A. Yes, sir.

Q. How much did you give for that stock?

A. $300,000.

Q. For the stock?

A. Yes, sir.

Q. That's what you paid for the stock?

A. Yes, sir.

Q. Did you examine the books before you purchased it?

A. No, sir; did not. I was not asked to examine them and they were not shown me.

Q. Didn't any of you examine them?

A. I think not.

Q. Just took it blind without knowing what the earnings were?

A. We knew about it. Not blind about it. We knew what we were doing.

Q. You did know what you were doing?

A. We did.

Q. You did know what the earning capacity was, did you; How did you arrive at its earning capacity? Didn't you have to do that from the books?

290 A. Its earning capacity was adjudged of by statements from Mr. Beasely and Mr. Mott Tuggle, who was the superintendent at that time.

Q. Mr. Mott Tuggle was superintendent?

A. Yes, sir; he was superintendent.

Q. When you bought it?

A. Yes, sir; he was and we retained him for awhile.

Q. Who negotiated for the purchase of this?

A. I think mostly Mr. Samuel Spencer and myself.

Q. Where did you go—where did you have the negotiations at?

A. In Philadelphia.

Q. You went on there?

A. Yes, sir.

Q. You had a meeting then of the stockholders on Dec. 3, 1900, didn't you, to get authority to issue bonds?

A. There was a meeting — the stockholders in Philadelphia—the old stockholders.

Q. Who authorized the issue of these bonds, the new company or the old?

A. Must have been the old company because the new company was not in exi-tence. They had to elect me president in order to

nable me to sign these bonds, together with Mr. Spencer's private ecretary, who was elected secretary of the company.

Q. You did pass a resolution on December 3, 1890, to authorize he sale of bonds?

A. Yes, sir; I suppose so.

Q. You say the old company did that?

291 A. I don't know.

Q. I thought you said you had to put up $10,000 to show hat you would carry it out?

A. We did.

Q. Didn't you have to do it? Didn't you have to issue the bonds?

A. The new company?

Q. Issued the bonds, didn't they?

A. Yes, sir.

Q. That's right. Didn't the new company issue them upon the new resolutions which the new company passed?

A. You are too hard for me now. I don't think I can tell you exactly how that was done. I know they stated they would have to elect me president of the company in order to carry this out.

Q. You made a report to the meeting held in Feb'y, the 11th, 1891: that's when these books were opened, wasn't it: See if you didn't make that report to the meeting held Feb'y 11, 1891 (Handing witness minute book of the Columbus Water Works Company) Page 30, the first entry on the book?

A. Yes, sir; that was done in order to get rid of the old directors.

Q. I asked you if you didn't make this report: You made this report down there, didn't you?

A. Yes, sir.

Q. I notice in this report that it is under authority given by resolution of the stockholders at the meeting December 3, 1890: Where was that meeting held?

292 A. That meeting was held in Philadelphia.

Q. That done by the old stockholders or the new stockholders?

A. That must have been done by the old stockholders. Really there were but few stockholders. You see the amount there—that they placed so many shares to my credit.

Q. So many shares?

A. The new stockholders did not have a majority of the stock.

Q. Then the old stockholders had this bond issue made—authorized this bond issue in order to pay themselves that right?

A. I suppose so. That meeting was held but I can't give you the exact reason for it.

Q. You all wanted to buy the plant from them and they authorized you to issue bonds to the amount of this—this large amount of bonds in order to pay them for it, that right?

A. I think that's what it meant.

Q. They authorized themselves to issue bonds in order for you all to get money to pay them, that right?

A. I suppose so.

Q. Now Mr. Epping, ain't you mistaken about Mr. Beasly being Secretary and Treasurer at that time: Wasn't Mr. Townsend?

A. Mr. Townsend was secretary at that time in Philadelphia. Of course Mr. Beasely——

Q. Didn't you state awhile ago that you got your information from Mr. Beasely?

293 A. No: Mr. Beasely was secretary of the company here.

Q. I understood you to say that you got your information from Mr. Beasely, who was secretary and treasurer?

A. To some extent I got information from Mr. Beasely before I left for Philadelphia, in order to know something more about the system.

Q. He kept the books here, Mr. Beasely?

A. He did.

Q. What has become of those books?

A. That were kept here?

Q. Yes.

A. They were only rent—water rent books and didn't amount to anything.

Q. Where are they?

A. I don't know.

Q. You all came in possession of them, didn't you?

A. What?

Q. You all came in possession of them? Didn't he keep the books here showing the expenses of the concern? He certainly must have done that?

A. Yes, sir.

Q. Didn't you come in possession of those books?

A. No, sir; I never saw them. I don't know what you mean.

Q. Mr. Epping, I notice that you state in this report that you sold $325,000 of the new first mortgage bonds and 200 shares of stock for $292,500: That's correct?

A. No, I tnink not.

294 Q. Don't you say so: "On the 26th day of January, 1891, I sold $325,000 of new first mortgage bonds of the company to a syndicate in Baltimore, represented by Wilson, Colston & Co., under authority given by stockholders at their meeting of Dec. 3, 1890, together with 200 shares of the capital stock of the company in the treasury all for the sum of $292,500? Is that correct?

A. I suppose that is correct.

Q. Who did you sell that stock to?

A. I don't know. I sold it to myself, what I got, didn't I?

Q. I don't know. That's what I am asking you?

A. Isn't it given there?

Q. You said you sold it all to Wilson, Colston & Co. for $292,500. You sold those to Wilson, Colston & Co., isn't that correct,—the stock?

A. That certainly ought to be correct if it is put down there.

Q. For $292,500?

A. Yes, that's the amount I received, I know.

Q. You applied $150,000, you state, to the redemption of the bonds of '88?

A. Yes.

Q. Who did you pay that to?

A. The old company.

Q. The old company owned the bonds themselves?

A. Yes, sir; they owned the bonds.

Q. The stockholders owned the bonds of the company, that's correct?

A. I think so. Archer and several others.

Q. You say you paid for satisfying various indebtedness
295 of the company for construction and the purchase of property and advances for the purpose, by present and former stockholders, $128,565?

A. Yes, sir.

Q. Who did you pay that money to?

A. Don't I state there?

Q. You say to present and past stockholders: I want to know who you paid it to?

A. I paid it to the stockholders.

Q. What stockholders?

A. I don't recollect. I can't go back that far.

Q. Didn't you furnish an itemized statement? Is this all the statement you made to the company: Didn't you take any receipts for this money?

A. I don't know.

Q. Isn't it a fact that you took receipts for the money you paid out?

A. Yes, I suppose I did. I don't know.

Q. Don't you know who you paid it to?

A. I paid it to the stockholders.

Q. What stockholders?

A. Stockholders of the water company—the old stockholders.

Q. You say past and present stockholders: How much did you pay yourself: How much did you get of that $128,500?

A. I didn't get any of it. I don't think. The balance of the money I brought home and put it in the bank here.

296 Q. How much did you pay Mr. Foley?

A. I don't think I paid him any.

Q. How much did you pay Mr. Garrard?

A. I didn't pay Mr. Garrard any.

Q. And none to yourself?

A. No.

Q. Then this is not correct that you paid it to past and present stockholders?

A. Why ain't it correct?

Q. You say you didn't pay the present stockholders anything? Didn't you state that?

A. The present stockholders?

Q. Yes, the stockholders who purchased that stock?

A. I don't think they got any money at all.

Q. Then why did you state in here that you paid it to the present and past stockholders?

A. I don't know why that was done.

Q. You say you didn't pay them none of it?

A. No, neither one of them received anything from that sale of bonds.

Q. You bought the property then by issuing bonds and the sale of stock that was in the treasury: that's what you paid for the property?

A. I don't know. I don't know what you mean.

Q. Didn't you say you paid $300,000 for the——

A. We had already paid $10,000.

Q. Who paid that?

A. I did.

297 Q. Who furnished the money?

A. I borrowed the money.

Q. Then you paid all of the $10,000 yourself?

A. Yes, sir; and got it back afterwards in stock.

Q. Got it back afterwards in stock?

A. Yes, sir.

Q. Did anybody else pay any of it?

A. Of that ten thousand?

Q. Yes?

A. No, I think not.

Q. Didn't you state that you sold stock and bonds for $292,500: How did you get the difference between that and $300,000?

A. This ten thousand had already been paid.

Q. Was it paid back to you?

A. It was paid back, I suppose, in stock.

Q. Who paid it back to you?

A. I suppose I paid it back to myself by issuing stock.

Q. Out of what money? Was it part of this $128,000?

A. They deducted this from the original price, the $10,000. They had credited me with the ten thousand dollars.

Q. I understood that: I asked you who contributed it?

A. I told you I borrowed it in Philadelphia.

Q. Then I ask you now how you paid this back?

A. I paid it back to the parties. No such debt in existence now

Q. You gave that much: you made a donation of that much?

298 A. No, I did not. I got something for it. I don't know what it was.

Q. Well, didn't you furnish the company, at the time you made this report, with an itemized statement of the persons to whom you paid the money?

A. Yes, sir.

Q. This don't say to who: It says to present and past stockholders for various indebtedness?

A. I didn't make any: and they didn't ask for any further report.

Q. I notice this on these minutes: two hundred shares of the

capital stock of the company, above referred to, have been issued as follows: H. H. Epping, 17 shares; H. H. Epping, 33 shares; L. F. Garrard 50, T. M. Foley 50 and S. Spencer, 50. Did they pay anything for it?

A. I don't know.

Q. In accordance with instructions of the purchasing syndicate: Why did they give you authority to issue stock, the purchasing syndicate?

A. I had been elected an officer of the company.

Q. Wasn't the purchasing syndicate Wilson, Colston & Co.?

A. Wilson, Colston & Co. were what?

Q. Wasn't the purchasing syndicate and don't you say here that you sold the stock and bonds to Wilson, Colston & Co.?

A. Must be some mistake about that. They were the purchasing syndicate of the bonds.

Q. They purchased the stock to-, didn't they: don't it
299 say so?

A. I don't so understand it at all.

Q. Read that yourself and see if that is not in your own handwriting—if that is not what you say (Handing witness minute book of the Columbus Water Works Company) I will ask you if Wilson, Colston & Co. did not buy the stock and the bonds?

A. I sold $325,000. of the new mortgage bonds of the company.

Q. Then you did sell the stock to them?

A. I suppose I did if I say so there; and afterwards give it back to us, I suppose.

Q. They made you a donation of that, is that right?

A. I suppose so. I don't know. That's the way it must have been done.

Mr. WIMBERLY: I submit that it don't say that he sold the stock to Wilson, Colston & Co. It says he sold so many bonds to them and reported the sale of that much stock; don't say they bought the stock. On the contrary the next page shows who bought the stock; says that four other individuals bought the stock.

The MASTER: Counsel for the defendant is reading extracts from the minutes—from a report on the minutes.

Mr. WIMBERLY: He is reading deductions from it.

The MASTER: He read this extract and asked the witness if that was correct and asked the witness to explain it. If there is
300 anything further in here that he does not elect to read, you have a perfect right to refer to it.

Mr. MARTIN: I will ask that the whole of this go in. We are going to ask that the whole of it go in at the proper time, unless they do.

Mr. WIMBERLY: The point I make is that I think he has got Mr. Epping under the impression that the minutes there state that he sold Wilson, Colston & Co. the stock. I don't so understand the minutes to say.

Mr. MARTIN: The minutes speak for themselves.

The MASTER: You can examine him again in chief on that point.

Q. The purchasing syndicate was Wilson, Colston & Co., wasn't it?
A. Yes, sir; they were the agents.
Q. They represented the purchasing syndicate, didn't they?
A. Yes, sir; I suppose so.
Q. Now when you say this: Two hundred shares of the capital stock of the company above referred to have been issued to these different parties, in accordance with instructions from the purchasing syndicate, ain't that the syndicate you refer to?
A. I don't know. I don't recollect any other syndicate. Must be.
Q. Now Mr. Epping, you say you all paid $300,000. for these works—for this system?
A. So I understand. That's my recollection.
Q. As a matter of fact did you pay a dollar?
A. What?
301 Q. Did you all pay one dollar—did you pay one cent?
A. We advanced this ten thousand dollars.
Q. That's all you paid; and you got that back, didn't you?
A. We got it back—we got stock for it, I think.
Q. You had done sold that, didn't you: What did you pay for it when you got it back?
A. I suppose it was understood by Wilson, Colston & Co. that they bought that for us.
Q. Bought it for you all?
A. Yes, sir.
Q. And you were selling it?
A. No.
Q. Didn't you sell it?
A. Sell the stock?
Q. Yes?
A. No, the old company sold the stock.
Q. Wasn't you the president?
A. Yes, made me president of the company.
Q. Did you state that you sold it?
A. What?
Q. Didn't you state in this report that H. H. Epping sold it?
A. I presume I did.
Q. Didn't you sell it?
A. No, I told you I didn't think it was sold.
Q. You don't think it was?
A. No.
Q. Then these present stockholders didn't put up anything, did they?
A. Not that I recollect of now. I don't know how that is.
Q. How much money was divided among them at that sale—out of the sale? How much was divided among the four out of the sale between you, Mr. Foley, Mr. Garrard and Mr. Spencer?
A. None.
Q. No bonds given you?
A. No bonds.
302 Q. Any given to Mr. Spencer?
A. Mr. Spencer bought some and took them himself—paid money for them.

Q. At that time?
A. Yes. He was one of the syndicate that bought the bonds.
Q. One of the syndicate that bought the bonds and one of the stockholders?
A. Afterwards.
Q. He didn't pay anything for the stock, did he?
A. I can't tell you that. I don't know now.
Q. Did you pay anything for that stock?
A. What?
Q. Did you pay anything for that stock?
A. Yes.
Q. Who did you pay it to?
A. What?
Q. Who did you pay it to?
A. The stock was the stock that I received at that time for the labor performed and the negotiations made.
Q. Did you receive*d* these 650 shares for that?
A. No, I did not.
Q. What did you pay for these 650 shares?
A. Didn't receive no 650 shares.
Q. Let's see if you didn't?
A. What difference does it make to you or anybody else?

Mr. WIMBERLY: We object to this as irrelevant; and the holders of these bonds are entitled to the equitable remedies that the law allows them; and whatever may have taken place between the old stockholders and the new stockholders has not the remotest bearing in this case and the questions of law that will control it. * * * If he connects it with our bonds, show that we hold them fraudulently, I concede it is proper.

303 The MASTER: Of course I can't tell where this examination is going.

Q. Mr. Epping, in the stockholders' meeting on the 12 February, 1891, the day after this other directors' meeting, didn't you state there that you had 600 shares?
A. You asked me if I received 650 shares.
Q. That's where you refer to the mistake I made: I made a mistake in saying 650, did I?
A. Yes.
Q. You had 600?
A. Yes.
Q. Did you pay anything for that stock?
A. I don't see what right you have got to ask me such a question.
The MASTER: That's proper.
WITNESS: I shall not answer it.
The MASTER: It is proper for you to answer the question.
WITNESS: What I paid for it?
Q. Did you pay anything for it?
A. I can't answer the question. I think I shall have to refuse to answer it. I don't know what right you have got to ask it. I don't know what right I have got to say.

Q. I will ask you this question: What did Mr. L. F. Garrard pay for his 650 shares?

A. I don't think I have a right to answer that question. He had a right to buy that stock at any price he could.

Q. Did you pay anything for this stock, you and Mr. Spencer, you state you made this transaction: did you pay anything for the stock?

A. I know I did.

Q. What did you pay?

304 A. I don't want to answer. I don't want to make that public.

Q. You don't?

A. I don't see any reason for it; or that anybody has got any interest in it.

Mr. WIMBERLY: We don't object to Mr. Epping answering it.

The MASTER: I think if it is within his knowledge that it is proper for him to answer the question, unless the testimony would incriminate him.

Mr. MARTIN: If he puts it upon that ground I will withdraw the question, if he puts it upon the ground that it will incriminate him.

Mr. WIMBERLY: He puts it upon the ground that it is his own private concern.

WITNESS: Private transactions that I don't think you have a right to look into.

Mr. WIMBERLY: We have nothing to conceal about it, so far as our clients are concerned.

The MASTER: The witness has been asked a question and he declines to answer it. If counsel on the other side insist on his answering it and it is a fact within his knowledge, he will, under the rule, be compelled to answer it, unless it be something that criminates him. Of course when I say that I say it simply in ruling.

Mr. WIMBERLY: I want it to go in the record that we are not objecting to his answering it.

The MASTER: The court does not intimate that he has any idea, that he is refusing to answer the question because it crimi-

305 nates him. That is a rule of evidence. I say to Mr. Epping if he knows the fact he can't withhold his answer, if the other side insists on it, except under the protection the laws of evidence or rules of evidence gives him.

Mr. GARRARD: We have no objection to his answering it.

The MASTER (addressing witness): Your counsel say they have no objection to your answering it. You need not answer it if it involves a transaction which you feel——

WITNESS (interrupting): I can answer it in this way: that the parties paid for their stock in labor, in work and in credit.

Q. Had they paid anything on the 12th day of February, 1891: Didn't you say they had just got it on that day?

A. What they did was in work.

Q. In work prior to that time or subsequent to that time?

A. They worked in order to get control of the plant.
Q. These 600 shares represent $30,000, do they not?
A. Yes, sir.
Q. You had paid $30,000 in work for your part of the stock, that's correct, isn't it?
A. Yes, I paid for it.
Q. Mr. Garrard's 650 shares represent $32,500, do they not?
A. Yes, sir.
Q. He paid that much in work—in labor?
A. Was interested and so understood at the time.

Q. Mr. Foley's 650 shares represent $32,500, he paid the
306 same?

A. Yes, sir.
Q. What work did you perform?
A. We were also to have our bonds taken. O, well, we travelled a good deal and had a good deal of work to do.
Q. Did Mr. Foley go up there?
A. O, yes.
Q. Did Mr. Garrard go up there?
A. Yes.
Q. I thought you said awhile ago that nobody went but you and Mr. Spencer?
A. At that particular meeting I don't think Mr. Garrard was present, no.
Q. What time did he go there?
A. We went on together.
Q. When?
A. We were together at that time,—no, not in February; but in December, I think it was.
Q. In December? Didn't you state he was not a stockholder at that time?
A. I did not.
Q. Haven't you stated that he was not a stockholder until February: Didn't you say the stock was not delivered until the bonds were sold?
A. No, I don't think it was.
Q. Then he was not a stockholder when he went on, was he?
A. What?
Q. He was not a stockholder when he went on, was he?
A. No.
Q. Did you pay him for something he didn't do?
A. The labor was not performed as a stockholder.
Q. You all saw proper to pay him that amount for his labor which he did then?
A. Yes.
Q. It was a voluntary act upon the part of the corporation?

A. Yes, sir. No compulsion at all. Never thought there
307 was anything wrong in that transaction. Don't see how there could be. Don't see how that evidence can affect the question.

Q. You signed this mortgage that is set up in this bill, didn't you, as President?

A. Yes, sir.

Q. You recite in here: I will read this: (reading) "And whereas, heretofore, to-wit, on the 3rd day of December, 1890, the stockholders of the said Columbus Water Works Company, at a meeting duly called for the purpose of devising means for raising money for its corporate purposes, unanimously adopted the following resolutions: Whereas this company did on the first day of November, 1888, make and execute a deed of trust to secure its issue of $150,000 of bonds." Where did you get that resolution in order to put it in this mortgage? Didn't you get it off the books? Didn't you have to see the books in order to find out about this resolution?

A. What?

Q. Didn't you have to examine the books in order to find out about this resolution? Wasn't this a copy from the books?

A. In Philadelphia, I suppose it was.

Q. Where was the office of the Columbus Water Works Company? Wasn't it by its charter situated here in Columbus?

A. Yes, sir; near Columbus, in Alabama.

Q. Well, was it held over there?

A. What?

Q. Was the meeting held over there?

308 A. No, the charter is in Georgia.

Q. You had to see or examine these books, didn't you?

A. I suppose so. I don't recollect now.

The MASTER: Didn't you get Mr. Colston's affidavit?

Mr. WIMBERLY: Yes, sir.

The MASTER: You speak of the old and the new company?

WITNESS: Yes, sir.

The MASTER:

Q. Was there a new corporation formed when you made the purchase of this stock of the water works company, the old company, and a new charter, or were there two water works company and only one original charter? You speak of the old and new company?

WITNESS: Yes, sir.

The MASTER: There were two?

Mr. WIMBERLY: Only one charter. No contention as to that

By the MASTER: I want to get it clear in my mind with respect to the old and new company: You mean the old stockholders as compared with the new stockholders, as compared to this sale?

WITNESS: I mean that the stock was transferred to the new stockholders.

Q. When you say the new company, you mean the purchasing stockholders from the original stockholders of the Columbus Water Works Company? Is that it?

A. I think that it was in this way; that the new stockholders bought the property and then issued stock to themselves.

Q. There is only one charter and one company?

309 A. I think so. I have never seen the charter.

(By Mr. MARTIN:)

Q. I will ask you if you made that statement?

A. That statement was made by Mr. Tuggle.

Q. Didn't you sign it?

A. Yes, sir; I signed it after he did.

Q. You made it?

A. I presume it can be so considered. Mr. Tuggle made the statement, I presumed it was correct and I signed it.

Q. You read it, didn't you: You made it as President of the company?

A. It seems so.

Q. Do you know who prepared that statement?

A. I do not.

Q. Mr. Tuggle didn't prepare it, did he?

A. I think not.

Q. Who did prepare it?

A. I don't know.

Q. Did you prepare it?

A. No, I don't think I did. Hold on a minute and I will tell you: When was this issued?

Q. Dated January 27, 1891?

A. I don't know who prepared it. I see some of my figuring in there. I know the figures are correct.

Q. The figures are correct, are they?

A. Yes, so far as I know. There is only one inaccuracy in it and that the amount of——

Q. One hundred and forty million gallons: Are they the figures?

A. Yes; but the reservoirs never had that much within my own knowledge. It was the engineer who stated that fact. I think Mr. Yocum was one of them, who estimated the storage at 140,-
310 000,000 for the two reservoirs, which is not so—which is not correct. It is not material, however, the storage capacity is ample for all purposes for a city which has 12,000 inhabitants—ten or fifteen thousand. That's my signature.

The MASTER: Does he identify the paper as having signed it?

WITNESS: Yes, sir; but I don't know who prepared it. Somebody got me to put the figures in afterwards, I suppose.

Q. Mr. Epping, you state in here that the cost of running the company does not exceed $4500.?

A. It did not at that time. That's correct.

Q. How did you ascertain that? Did you get it from the books?

A. Yes, sir.

Q. Where are the books?

A. I don't know whether I got it from any books or not. Mr. Beasely made out that statement and showed me that statement.

Q. You verified it to see if it was correct before you put your signature to it, isn't that true?

A. Yes, I verified it from him telling me so. That's what he told me then. It has been a little more since.

Q. Not asking you what it has been before or since, I asked you where you got those figures from: What books?

A. Didn't get it from any books that I know of. I don't recollect.

Q. You state in here that the present earnings are on a basis of about $32,000. per annum: How did you get that amount of earnings?

311 A. I could have got that from Mr. Beasely, I suppose.

Q. Mr. Beasely wasn't elected until February, was he?

A. Yes, sir; Mr. Beasely, as I told you, was the Secretary of the old company for a short time.

Q. Didn't you elect him there in February to take Mr. Townsend's place?

A. They retained him.

Q. Wasn't Mr. Townsend the secretary?

A. He was the secretary only when we were at work in Philadelphia He was our secretary—secretary of the new company, Mr. Townsend, for the time being for convenience sake. Mr. Spencer recommended him. Mr. Spencer knew all about him.

The MASTER: Mr. Beasely was the regular secretary of the company?

A. He was.

The MASTER: In the meeting in Philadelphia you had Mr. Townsend elected temporary secretary?

A. Yes, sir.

Q. Mr. Epping, did I understand you, in answer to Judge Wimberly's question to say that the company took action to extend this system prior to along about July or May of 1892—1902?

A. We contemplated extending the system.

Q. Did you take any action on it—any corporate action?

A. I don't recollect now. We contemplated making these improvements, yes.

The MASTER: Did you take any action—did you do anything?

A. I think not: I don't recollect now.

Q. If the first action you took was on the 25th of September, 1902: Look at these minutes and see if that is not the first

312 action you took: Isn't that the meeting right after Feb'y 13, 1902 and the next one was September 25: Isn't that right.

The MASTER: Give the page.

Q. Minute book of the Columbus Water Works Co., between pages 132 and 133, pinned? That's the last meeting you held between February—after February, wasn't it September 25, 1902: You had not taken any action prior to that time, had you?

A. None that I recollect of.

Q. Then it is not a fact that you all had taken any steps towards having a new system prior to that time, between February and September?

A. For a new system?

Q. I mean improving your system?

A. O, yes; we were contemplating making improvements all the time if we could have got the money, we would have made these improvements, yes.

Q. Could have got the money?

A. Yes, sir.

Q. Therefore the needed improvements a long time prior to that time you did not do on account of not having the money, isn't that a fact?

A. Yes, sir.

Q. You would have made the improvements way back in '93 and '94 if you could have gotten the money, wouldn't you?

A. We did make improvements.

Q. What improvements did you make in '93 and '94?

A. I don't recollect what they were. Improvements were made all the time.

Q. You speak of no complaints being made to you except such as are on these minutes that have been introduced—some council records?

A. Yes, sir.

313 Q. You knew about these complaints, did you: the official action of the council?

A. No; they didn't give us any official action of any complaints.

Q. They did not?

A. Did not.

Q. Didn't you acknowledge service of complaints by writing back to them?

A. I don't know how that is. I don't recollect it. I don't recollect——

Mr. WIMBERLY: We object to that. The writings prove themselves.

Mr. MARTIN: Not going into the writings: going into the facts.

The MASTER: I don't understand that he is going into the writings at all.

Q. Did you receive any communications from the council with reference to complaints about the system, as to a filter, the size of the mains and the pressure?

Objected to on the ground that the communications speak for themselves.

Mr. MARTIN: What I want to get at is, whether their attention officially was not called to them by the council?

WITNESS: I can't recollect. I would have to go and make an examination before I could answer the question. I can't recollect it.

Q. Was there any need for an increase of supply of water in '95?

A. I don't think so. I think there was plenty.

Q. Why did you buy this property then to increase the supply?

A. Our own wish. We wanted to increase the supply and

314 we wanted to satisfy everybody. We were perfectly willing to make these improvements.

Q. You mean to say that you would spend large sums of money unnecessary, that it?

A. Didn't think it was necessary as far as the contract was concerned. It was necessary for our own satisfaction.

Q. For your own satisfaction?

A. Yes, sir.

Q. You recognized the fact that these four inch mains were too small?

A. Yes; but we understood that they had been put in by order of council.

Q. How did you understand it?

A. Generally.

Q. It don't say so in the contract, does it?

A. No, I think not.

Mr. WIMBERLY: The contract speaks for itself. I don't think this witness is called upon to construe the contract.

Mr. MARTIN: My friend asked more witnesses than one about that contract time and again.

The MASTER: The contract speaks for itself.

Q. How did you get your information that they were put in there by order of the city: Did the city inform you that they had done it?

A. When it was brought up, it was stated that the city ordered the four inch mains.

Q. Who stated it?

A. I don't recollect. I think it was Mr. Garrard: You asked me who it was that stated the city had ordered the four inch mains?

The MASTER: Do you know who made that statement?

WITNESS: I say I think it was Mr. Garrard.

Q. You then didn't get it from the city officials?

315 A. No, I think not. I never talked to them about it.

Q. You recognized that they were too small and agreed to take them up, didn't you?

A. My superintendent says——

Q. (Interrupting.) Not talking about what your superintendent says?

A. I don't know much about it.

Q. You don't?

A. No, sir; I am not an expert.

Q. You would have taken them up and put them down larger if you had had more money—if you could have gotten the money?

A. Yes, if we had had plenty of money we would have taken them up.

Q. You would have enlarged your source of supply if you had had plenty of money?

A. Didn't think that was necessary.

Q. You would have done it, wouldn't you?

A. I don't know positively that we would; but I think we would have done it.

Q. Don't you think it would have been necessary?

A. No, I hardly think so. Has not been any demand. We supplied all the demand that has been asked for.

Q. You had a very severe drought in the Fall of '95, didn't you?

A. Yes, sir.

Q. Didn't the water get very low?

A. Yes, sir.

Q. The upper reservoir went dry, didn't it?

Q. From the Stewart Spring you mean?
A. Yes, sir.
Q. When was that time, can you fix the date?
A. No, I can't fix the dates. They were the hands employed by the Columbus Railroad Co. and Mr. Flournoy and Mr. Garrard both went out with them. Mr. Daniel was in charge, I think.
Q. In your letter of August 7, 1894, you reported to council at a meeting immediately preceding this October meeting that you read just now, there were certain improvements that you referred to as being willing to make: What prevented you from making those improvements?
A. We were not asked to make the improvements. Mr. Chappell repeatedly stated that nothing but municipal ownership would satisfy him. No use making the improvements.
Q. This resolution that they would not be bound by the contract was passed before you had a chance to make any such improvements?
A. Yes, sir.
Q. What effect has that resolution and others like it, had upon the ability of the company to make contemplated improvements in its plant?
A. We could not get the money to make them.
Q. But for the passing of that resolution I will ask you whether there would have been improvements made that were not made?
A. I don't know that that was the only cause. Several
288 publications made in the newspapers injured our credit.
Q. You mean municipal ownership, things of that kind?
A. Yes, sir.
Q. All those collectively was the cause?
A. Yes, sir.
Q. This resolution was just part of it?
A. Yes, sir.
Q. I notice in these letters that you a number of times urged the city to try to come to some agreement and offered to do what was fair: could you ever get the city to do that—to come to any agreement?
A. Finally: there was an agreement made finally.
Q. In 1900. But from '94 were you able to get the city to specify definitely what it wanted and give you some assurance——
A. No, I think not.

Cross-examination.

(By Mr. Martin:)

Q. What time in '90 did you and the others purchase the stock of Mr. Archer and the other stockholders of the old company?
A. I think it was consummated in February, 1891.
Q. I am talking about when did you buy the stock?
A. We didn't buy the stock until we bought—at the same time they delivered the stock, they had agreed to cancel the bonds they had issued and give them up to us.

Q. What time in 1890 did you make a contract to purchase?

289 A. It was sometime in the Fall of '90.

Q. The Fall of '90?

A. They made us put up a certain amount of money to show that we were in earnest.

Q. Who were the purchasers?

A. It was Mr. Samuel Spencer, Mr. Louis Garrard, myself and Mr. Foley.

Q. You four?

A. Yes, sir.

Q. How much did you give for that stock?

A. $300,000.

Q. For the stock?

A. Yes, sir.

Q. That's what you paid for the stock?

A. Yes, sir.

Q. Did you examine the books before you purchased it?

A. No, sir; did not. I was not asked to examine them and they were not shown me.

Q. Didn't any of you examine them?

A. I think not.

Q. Just took it blind without knowing what the earnings were?

A. We knew about it. Not blind about it. We knew what we were doing.

Q. You did know what you were doing?

A. We did.

Q. You did know what the earning capacity was, did you: How did you arrive at its earning capacity? Didn't you have to do that from the books?

290 A. Its earning capacity was adjudged of by statements from Mr. Beasely and Mr. Mott Tuggle, who was the superintendent at that time.

Q. Mr. Mott Tuggle was superintendent?

A. Yes, sir; he was superintendent.

Q. When you bought it?

A. Yes, sir; he was and we retained him for awhile.

Q. Who negotiated for the purchase of this?

A. I think mostly Mr. Samuel Spencer and myself.

Q. Where did you go—where did you have the negotiations at?

A. In Philadelphia.

Q. You went on there?

A. Yes, sir.

Q. You had a meeting then of the stockholders on Dec. 3, 1900, didn't you, to get authority to issue bonds?

A. There was a meeting — the stockholders in Philadelphia—the old stockholders.

Q. Who authorized the issue of these bonds, the new company or the old?

A. Must have been the old company because the new company was not in existence. They had to elect me president in order to

enable me to sign these bonds, together with Mr. Spencer's private secretary, who was elected secretary of the company.

Q. You did pass a resolution on December 3, 1890, to authorize the sale of bonds?

A. Yes, sir; I suppose so.

Q. You say the old company did that?

291 A. I don't know.

Q. I thought you said you had to put up $10,000 to show that you would carry it out?

A. We did.

Q. Didn't you have to do it? Didn't you have to issue the bonds?

A. The new company?

Q. Issued the bonds, didn't they?

A. Yes, sir.

Q. That's right. Didn't the new company issue them upon the new resolutions which the new company passed?

A. You are too hard for me now. I don't think I can tell you exactly how that was done. I know they stated they would have to elect me president of the company in order to carry this out.

Q. You made a report to the meeting held in Feb'y, the 11th, 1891: that's when these books were opened, wasn't it: See if you didn't make that report to the meeting held Feb'y 11, 1891 (Handing witness minute book of the Columbus Water Works Company) Page 30, the first entry on the book?

A. Yes, sir; that was done in order to get rid of the old directors.

Q. I asked you if you didn't make this report: You made this report down there, didn't you?

A. Yes, sir.

Q. I notice in this report that it is under authority given by resolution of the stockholders at the meeting December 3, 1890: Where was that meeting held?

292 A. That meeting was held in Philadelphia.

Q. That done by the old stockholders or the new stockholders?

A. That must have been done by the old stockholders. Really there were but few stockholders. You see the amount there—that they placed so many shares to my credit.

Q. So many shares?

A. The new stockholders did not have a majority of the stock.

Q. Then the old stockholders had this bond issue made—authorized this bond issue in order to pay themselves that right?

A. I suppose so. That meeting was held but I can't give you the exact reason for it.

Q. You all wanted to buy the plant from them and they authorized you to issue bonds to the amount of this—this large amount of bonds in order to pay them for it, that right?

A. I think that's what it meant.

Q. They authorized themselves to issue bonds in order for you all to get money to pay them, that right?

A. I suppose so.

Q. Now Mr. Epping, ain't you mistaken about Mr. Beasly being Secretary and Treasurer at that time: Wasn't Mr. Townsend?

A. Mr. Townsend was secretary at that time in Philadelphia. Of course Mr. Beasely——

Q. Didn't you state awhile ago that you got your information from Mr. Beasely?

293 A. No: Mr. Beasely was secretary of the company here.

Q. I understood you to say that you got your information from Mr. Beasely, who was secretary and treasurer?

A. To some extent I got information from Mr. Beasely before I left for Philadelphia, in order to know something more about the system.

Q. He kept the books here, Mr. Beasely?

A. He did.

Q. What has become of those books?

A. That were kept here?

Q. Yes.

A. They were only rent—water rent books and didn't amount to anything.

Q. Where are they?

A. I don't know.

Q. You all came in possession of them, didn't you?

A. What?

Q. You all came in possession of them? Didn't he keep the books here showing the expenses of the concern? He certainly must have done that?

A. Yes, sir.

Q. Didn't you come in possession of those books?

A. No, sir; I never saw them. I don't know what you mean.

Q. Mr. Epping, I notice that you state in this report that you sold $325,000 of the new first mortgage bonds and 200 shares of stock for $292,500: That's correct?

A. No, I tnink not.

294 Q. Don't you say so: "On the 26th day of January, 1891, I sold $325,000 of new first mortgage bonds of the company to a syndicate in Baltimore, represented by Wilson, Colston & Co., under authority given by stockholders at their meeting of Dec. 3, 1890, together with 200 shares of the capital stock of the company in the treasury all for the sum of $292,500? Is that correct?

A. I suppose that is correct.

Q. Who did you sell that stock to?

A. I don't know. I sold it to myself, what I got, didn't I?

Q. I don't know. That's what I am asking you?

A. Isn't it given there?

Q. You said you sold it all to Wilson, Colston & Co. for $292,500. You sold those to Wilson, Colston & Co., isn't that correct,—the stock?

A. That certainly ought to be correct if it is put down there.

Q. For $292,500?

A. Yes, that's the amount I received, I know.

Q. You applied $150,000, you state, to the redemption of the bonds of '88?
A. Yes.
Q. Who did you pay that to?
A. The old company.
Q. The old company owned the bonds themselves?
A. Yes, sir; they owned the bonds.
Q. The stockholders owned the bonds of the company, that's correct?
A. I think so. Archer and several others.

295 Q. You say you paid for satisfying various indebtedness of the company for construction and the purchase of property and advances for the purpose, by present and former stockholders, $128,565?
A. Yes, sir.
Q. Who did you pay that money to?
A. Don't I state there?
Q. You say to present and past stockholders: I want to know who you paid it to?
A. I paid it to the stockholders.
Q. What stockholders?
A. I don't recollect. I can't go back that far.
Q. Didn't you furnish an itemized statement? Is this all the statement you made to the company: Didn't you take any receipts for this money?
A. I don't know.
Q. Isn't it a fact that you took receipts for the money you paid out?
A. Yes, I suppose I did. I don't know.
Q. Don't you know who you paid it to?
A. I paid it to the stockholders.
Q. What stockholders?
A. Stockholders of the water company—the old stockholders.
Q. You say past and present stockholders: How much did you pay yourself: How much did you get of that $128,500?
A. I didn't get any of it, I don't think. The balance of the money I brought home and put it in the bank here.

296 Q. How much did you pay Mr. Foley?
A. I don't think I paid him any.
Q. How much did you pay Mr. Garrard?
A. I didn't pay Mr. Garrard any.
Q. And none to yourself?
A. No.
Q. Then this is not correct that you paid it to past and present stockholders?
A. Why ain't it correct?
Q. You say you didn't pay the present stockholders anything? Didn't you state that?
A. The present stockholders?
Q. Yes, the stockholders who purchased that stock?

A. I don't think they got any money at all.

Q. Then why did you state in here that you paid it to the present and past stockholders?

A. I don't know why that was done.

Q. You say you didn't pay them none of it?

A. No, neither one of them received anything from that sale of bonds.

Q. You bought the property then by issuing bonds and the sale of stock that was in the treasury: that's what you paid for the property?

A. I don't know. I don't know what you mean.

Q. Didn't you say you paid $300,000 for the——

A. We had already paid $10,000.

Q. Who paid that?

A. I did.

297 Q. Who furnished the money?

A. I borrowed the money.

Q. Then you paid all of the $10,000 yourself?

A. Yes, sir; and got it back afterwards in stock.

Q. Got it back afterwards in stock?

A. Yes, sir.

Q. Did anybody else pay any of it?

A. Of that ten thousand?

Q. Yes?

A. No, I think not.

Q. Didn't you state that you sold stock and bonds for $292,500: How did you get the difference between that and $300,000?

A. This ten thousand had already been paid.

Q. Was it paid back to you?

A. It was paid back, I suppose, in stock.

Q. Who paid it back to you?

A. I suppose I paid it back to myself by issuing stock.

Q. Out of what money? Was it part of this $128,000?

A. They deducted this from the original price, the $10,000. They had credited me with the ten thousand dollars.

Q. I understood that: I asked you who contributed it?

A. I told you I borrowed it in Philadelphia.

Q. Then I ask you now how you paid this back?

A. I paid it back to the parties. No such debt in existence now.

Q. You gave that much: you made a donation of that much?

298 A. No, I did not. I got something for it. I don't know what it was.

Q. Well, didn't you furnish the company, at the time you made this report, with an itemized statement of the persons to whom you paid the money?

A. Yes, sir.

Q. This don't say to who: It says to present and past stockholders for various indebtedness?

A. I didn't make any: and they didn't ask for any further report.

Q. I notice this on these minutes: two hundred shares of the

capital stock of the company, above referred to, have been issued as follows: H. H. Epping, 17 shares; H. H. Epping, 33 shares; L. F. Garrard 50, T. M. Foley 50 and S. Spencer, 50. Did they pay anything for it?

A. I don't know.

Q. In accordance with instructions of the purchasing syndicate: Why did they give you authority to issue stock, the purchasing syndicate?

A. I had been elected an officer of the company.

Q. Wasn't the purchasing syndicate Wilson, Colston & Co.?

A. Wilson, Colston & Co. were what?

Q. Wasn't the purchasing syndicate and don't you say here that you sold the stock and bonds to Wilson, Colston & Co.?

A. Must be some mistake about that. They were the purchasing syndicate of the bonds.

Q. They purchased the stock to-, didn't they: don't it
299 say so?

A. I don't so understand it at all.

Q. Read that yourself and see if that is not in your own handwriting—if that is not what you say (Handing witness minute book of the Columbus Water Works Company) I will ask you if Wilson, Colston & Co. did not buy the stock and the bonds?

A. I sold $325,000. of the new mortgage bonds of the company.

Q. Then you did sell the stock to them?

A. I suppose I did if I say so there; and afterwards give it back to us, I suppose.

Q. They made you a donation of that, is that right?

A. I suppose so. I don't know. That's the way it must have been done.

Mr. WIMBERLY: I submit that it don't say that he sold the stock to Wilson, Colston & Co. It says he sold so many bonds to them and reported the sale of that much stock; don't say they bought the stock. On the contrary the next page shows who bought the stock; says that four other individuals bought the stock.

The MASTER: Counsel for the defendant is reading extracts from the minutes—from a report on the minutes.

Mr. WIMBERLY: He is reading deductions from it.

The MASTER: He read this extract and asked the witness if that was correct and asked the witness to explain it. If there is
300 anything further in here that he does not elect to read, you have a perfect right to refer to it.

Mr. MARTIN: I will ask that the whole of this go in. We are going to ask that the whole of it go in at the proper time, unless they do.

Mr. WIMBERLY: The point I make is that I think he has got Mr. Epping under the impression that the minutes there state that he sold Wilson, Colston & Co. the stock. I don't so understand the minutes to say.

Mr. MARTIN: The minutes speak for themselves.

The MASTER: You can examine him again in chief on that point.

Q. The purchasing syndicate was Wilson, Colston & Co., wasn't it?
A. Yes, sir; they were the agents.
Q. They represented the purchasing syndicate, didn't they?
A. Yes, sir; I suppose so.
Q. Now when you say this: Two hundred shares of the capital stock of the company above referred to have been issued to these different parties, in accordance with instructions from the purchasing syndicate, ain't that the syndicate you refer to?
A. I don't know. I don't recollect any other syndicate. Must be.
Q. Now Mr. Epping, you say you all paid $300,000. for these works—for this system?
A. So I understand. That's my recollection.
Q. As a matter of fact did you pay a dollar?
A. What?
301 Q. Did you all pay one dollar—did you pay one cent?
A. We advanced this ten thousand dollars.
Q. That's all you paid; and you got that back, didn't you?
A. We got it back—we got stock for it, I think.
Q. You had done sold that, didn't you: What did you pay for it when you got it back?
A. I suppose it was understood by Wilson, Colston & Co. that they bought that for us.
Q. Bought it for you all?
A. Yes, sir.
Q. And you were selling it?
A. No.
Q. Didn't you sell it?
A. Sell the stock?
Q. Yes?
A. No, the old company sold the stock.
Q. Wasn't you the president?
A. Yes, made me president of the company.
Q. Did you state that you sold it?
A. What?
Q. Didn't you state in this report that H. H. Epping sold it?
A. I presume I did.
Q. Didn't you sell it?
A. No, I told you I didn't think it was sold.
Q. You don't think it was?
A. No.
Q. Then these present stockholders didn't put up anything, did they?
A. Not that I recollect of now. I don't know how that is.
Q. How much money was divided among them at that sale—out of the sale? How much was divided among the four out of the sale between you, Mr. Foley, Mr. Garrard and Mr. Spencer?
A. None.
Q. No bonds given you?
A. No bonds.
302 Q. Any given to Mr. Spencer?
A. Mr. Spencer bought some and took them himself—paid money for them.

Q. At that time?
A. Yes. He was one of the syndicate that bought the bonds.
Q. One of the syndicate that bought the bonds and one of the stockholders?
A. Afterwards.
Q. He didn't pay anything for the stock, did he?
A. I can't tell you that. I don't know now.
Q. Did you pay anything for that stock?
A. What?
Q. Did you pay anything for that stock?
A. Yes.
Q. Who did you pay it to?
A. What?
Q. Who did you pay it to?
A. The stock was the stock that I received at that time for the labor performed and the negotiations made.
Q. Did you received these 650 shares for that?
A. No, I did not.
Q. What did you pay for these 650 shares?
A. Didn't receive no 650 shares.
Q. Let's see if you didn't?
A. What difference does it make to you or anybody else?

Mr. WIMBERLY: We object to this as irrelevant; and the holders of these bonds are entitled to the equitable remedies that the law allows them; and whatever may have taken place between the old stockholders and the new stockholders has not the remotest bearing in this case and the questions of law that will control it. * * * If he connects it with our bonds, show that we hold them fraudulently, I concede it is proper.

303 The MASTER: Of course I can't tell where this examination is going.

Q. Mr. Epping, in the stockholders' meeting on the 12 February, 1891, the day after this other directors' meeting, didn't you state there that you had 600 shares?
A. You asked me if I received 650 shares.
Q. That's where you refer to the mistake I made: I made a mistake in saying 650, did I?
A. Yes.
Q. You had 600?
A. Yes.
Q. Did you pay anything for that stock?
A. I don't see what right you have got to ask me such a question.
The MASTER: That's proper.
WITNESS: I shall not answer it.
The MASTER: It is proper for you to answer the question.
WITNESS: What I paid for it?
Q. Did you pay anything for it?
A. I can't answer the question. I think I shall have to refuse to answer it. I don't know what right you have got to ask it. I don't know what right I have got to say.

Q. I will ask you this question: What did Mr. L. F. Garrard pay for his 650 shares?

A. I don't think I have a right to answer that question. He had a right to buy that stock at any price he could.

Q. Did you pay anything for this stock, you and Mr. Spencer, you state you made this transaction: did you pay anything for the stock?

A. I know I did.

Q. What did you pay?

304 A. I don't want to answer. I don't want to make that public.

Q. You don't?

A. I don't see any reason for it; or that anybody has got any interest in it.

Mr. WIMBERLY: We don't object to Mr. Epping answering it.

The MASTER: I think if it is within his knowledge that it is proper for him to answer the question, unless the testimony would incriminate him.

Mr. MARTIN: If he puts it upon that ground I will withdraw the question, if he puts it upon the ground that it will incriminate him.

Mr. WIMBERLY: He puts it upon the ground that it is his own private concern.

WITNESS: Private transactions that I don't think you have a right to look into.

Mr. WIMBERLY: We have nothing to conceal about it, so far as our clients are concerned.

The MASTER: The witness has been asked a question and he declines to answer it. If counsel on the other side insist on his answering it and it is a fact within his knowledge, he will, under the rule, be compelled to answer it, unless it be something that criminates him. Of course when I say that I say it simply in ruling.

Mr. WIMBERLY: I want it to go in the record that we are not objecting to his answering it.

The MASTER: The court does not intimate that he has any idea that he is refusing to answer the question because it crimi-

305 nates him. That is a rule of evidence. I say to Mr. Epping if he knows the fact he can't withhold his answer, if the other side insists on it, except under the protection the laws of evidence or rules of evidence gives him.

Mr. GARRARD: We have no objection to his answering it.

The MASTER (addressing witness): Your counsel say they have no objection to your answering it. You need not answer it if it involves a transaction which you feel——

WITNESS (interrupting): I can answer it in this way: that the parties paid for their stock in labor, in work and in credit.

Q. Had they paid anything on the 12th day of February, 1891: Didn't you say they had just got it on that day?

A. What they did was in work.

Q. In work prior to that time or subsequent to that time?

A. They worked in order to get control of the plant.
Q. These 600 shares represent $30,000, do they not?
A. Yes, sir.
Q. You had paid $30,000 in work for your part of the stock, that's correct, isn't it?
A. Yes, I paid for it.
Q. Mr. Garrard's 650 shares represent $32,500, do they not?
A. Yes, sir.
Q. He paid that much in work—in labor?
A. Was interested and so understood at the time.

306 Q. Mr. Foley's 650 shares represent $32,500, he paid the same?
A. Yes, sir.

Q. What work did you perform?
A. We were also to have our bonds taken. O, well, we travelled a good deal and had a good deal of work to do.
Q. Did Mr. Foley go up there?
A. O, yes.
Q. Did Mr. Garrard go up there?
A. Yes.
Q. I thought you said awhile ago that nobody went but you and Mr. Spencer?
A. At that particular meeting I don't think Mr. Garrard was present, no.
Q. What time did he go there?
A. We went on together.
Q. When?
A. We were together at that time,—no, not in February; but in December, I think it was.
Q. In December? Didn't you state he was not a stockholder at that time?
A. I did not.
Q. Haven't you stated that he was not a stockholder until February: Didn't you say the stock was not delivered until the bonds were sold?
A. No, I don't think it was.
Q. Then he was not a stockholder when he went on, was he?
A. What?
Q. He was not a stockholder when he went on, was he?
A. No.
Q. Did you pay him for something he didn't do?
A. The labor was not performed as a stockholder.
Q. You all saw proper to pay him that amount for his labor which he did then?
A. Yes.
Q. It was a voluntary act upon the part of the corporation?

307 A. Yes, sir. No compulsion at all. Never thought there was anything wrong in that transaction. Don't see how there could be. Don't see how that evidence can affect the question.

Q. You signed this mortgage that is set up in this bill, didn't you, as President?

A. Yes, sir.

Q. You recite in here: I will read this: (reading) "And whereas, heretofore, to-wit, on the 3rd day of December, 1890, the stockholders of the said Columbus Water Works Company, at a meeting duly called for the purpose of devising means for raising money for its corporate purposes, unanimously adopted the following resolutions: Whereas this company did on the first day of November, 1888, make and execute a deed of trust to secure its issue of $150,000 of bonds." Where did you get that resolution in order to put it in this mortgage? Didn't you get it off the books? Didn't you have to see the books in order to find out about this resolution?

A. What?

Q. Didn't you have to examine the books in order to find out about this resolution? Wasn't this a copy from the books?

A. In Philadelphia, I suppose it was.

Q. Where was the office of the Columbus Water Works Company? Wasn't it by its charter situated here in Columbus?

A. Yes, sir; near Columbus, in Alabama.

Q. Well, was it held over there?

A. What?

Q. Was the meeting held over there?

308 A. No, the charter is in Georgia.

Q. You had to see or examine these books, didn't you?

A. I suppose so. I don't recollect now.

The MASTER: Didn't you get Mr. Colston's affidavit?

Mr. WIMBERLY: Yes, sir.

The MASTER: You speak of the old and the new company?

WITNESS: Yes, sir.

The MASTER:

Q. Was there a new corporation formed when you made the purchase of this stock of the water works company, the old company, and a new charter, or were there two water works company and only one original charter? You speak of the old and new company?

WITNESS: Yes, sir.

The MASTER: There were two?

Mr. WIMBERLY: Only one charter. No contention as to that

By the MASTER: I want to get it clear in my mind with respect to the old and new company: You mean the old stockholders as compared with the new stockholders, as compared to this sale?

WITNESS: I mean that the stock was transferred to the new stockholders.

Q. When you say the new company, you mean the purchasing stockholders from the original stockholders of the Columbus Water Works Company? Is that it?

A. I think that it was in this way: that the new stockholders bought the property and then issued stock to themselves.

Q. There is only one charter and one company?

309 A. I think so. I have never seen the charter.

(By Mr. MARTIN:)

Q. I will ask you if you made that statement?

A. That statement was made by Mr. Tuggle.

Q. Didn't you sign it?

A. Yes, sir; I signed it after he did.

Q. You made it?

A. I presume it can be so considered. Mr. Tuggle made the statement, I presumed it was correct and I signed it.

Q. You read it, didn't you: You made it as President of the company?

A. It seems so.

Q. Do you know who prepared that statement?

A. I do not.

Q. Mr. Tuggle didn't prepare it, did he?

A. I think not.

Q. Who did prepare it?

A. I don't know.

Q. Did you prepare it?

A. No, I don't think I did. Hold on a minute and I will tell you: When was this issued?

Q. Dated January 27, 1891?

A. I don't know who prepared it. I see some of my figuring in there. I know the figures are correct.

Q. The figures are correct, are they?

A. Yes, so far as I know. There is only one inaccuracy in it and that the amount of——

Q. One hundred and forty million gallons: Are they the figures?

A. Yes; but the reservoirs never had that much within my own knowledge. It was the engineer who stated that fact. I think Mr. Yocum was one of them, who estimated the storage at 140,-
310 000,000 for the two reservoirs, which is not so—which is not correct. It is not material, however, the storage capacity is ample for all purposes for a city which has 12,000 inhabitants—ten or fifteen thousand. That's my signature.

The MASTER: Does he identify the paper as having signed in?

WITNESS: Yes, sir; but I don't know who prepared it. Somebody got me to put the figures in afterwards, I suppose.

Q. Mr. Epping, you state in here that the cost of running the company does not exceed $4500.?

A. It did not at that time. That's correct.

Q. How did you ascertain that? Did you get it from the books?

A. Yes, sir.

Q. Where are the books?

A. I don't know whether I got it from any books or not. Mr. Beasely made out that statement and showed me that statement.

Q. You verified it to see if it was correct before you put your signature to it, isn't that true?

A. Yes, I verified it from him telling me so. That's what he told me then. It has been a little more since.

Q. Not asking you what it has been before or since, I asked you where you got those figures from: What books?

A. Didn't get it from any books that I know of. I don't recollect.

Q. You state in here that the present earnings are on a basis of about $32,000. per annum: How did you get that amount of earnings?

311 A. I could have got that from Mr. Beasely, I suppose.

Q. Mr. Beasely wasn't elected until February, was he?

A. Yes, sir; Mr. Beasely, as I told you, was the Secretary of the old company for a short time.

Q. Didn't you elect him there in February to take Mr. Townsend's place?

A. They retained him.

Q. Wasn't Mr. Townsend the secretary?

A. He was the secretary only when we were at work in Philadelphia He was our secretary—secretary of the new company, Mr. Townsend, for the time being for convenience sake. Mr. Spencer recommended him. Mr. Spencer knew all about him.

The MASTER: Mr. Beasely was the regular secretary of the company?

A. He was.

The MASTER: In the meeting in Philadelphia you had Mr. Townsend elected temporary secretary?

A. Yes, sir.

Q. Mr. Epping, did I understand you, in answer to Judge Wimberly's question to say that the company took action to extend this system prior to along about July or May of 1892—1902?

A. We contemplated extending the system.

Q. Did you take any action on it—any corporate action?

A. I don't recollect now. We contemplated making these improvements, yes.

The MASTER: Did you take any action—did you do anything?

A. I think not: I don't recollect now.

Q. If the first action you took was on the 25th of September, 1902: Look at these minutes and see if that is not the first

312 action you took: Isn't that the meeting right after Feb'y 13, 1902 and the next one was September 25: Isn't that right.

The MASTER: Give the page.

Q. Minute book of the Columbus Water Works Co., between pages 132 and 133, pinned? That's the last meeting you held between February—after February, wasn't it September 25, 1902: You had not taken any action prior to that time, had you?

A. None that I recollect of.

Q. Then it is not a fact that you all had taken any steps towards having a new system prior to that time, between February and September?

A. For a new system?

Q. I mean improving your system?

A. O, yes; we were contemplating making improvements all the time if we could have got the money, we would have made these improvements, yes.

Q. Could have got the money?

A. Yes, sir.

Q. Therefore the needed improvements a long time prior to that time you did not do on account of not having the money, isn't that a fact?

A. Yes, sir.

Q. You would have made the improvements way back in '93 and '94 if you could have gotten the money, wouldn't you?

A. We did make improvements.

Q. What improvements did you make in '93 and '94?

A. I don't recollect what they were. Improvements were made all the time.

Q. You speak of no complaints being made to you except such as are on these minutes that have been introduced—some council records?

A. Yes, sir.

313 Q. You knew about these complaints, did you: the official action of the council?

A. No; they didn't give us any official action of any complaints.

Q. They did not?

A. Did not.

Q. Didn't you acknowledge service of complaints by writing back to them?

A. I don't know how that is. I don't recollect it. I don't recollect——

Mr. WIMBERLY: We object to that. The writings prove themselves.

Mr. MARTIN: Not going into the writings: going into the facts.

The MASTER: I don't understand that he is going into the writings at all.

Q. Did you receive any communications from the council with reference to complaints about the system, as to a filter, the size of the mains and the pressure?

Objected to on the ground that the communications speak for themselves.

Mr. MARTIN: What I want to get at is, whether their attention officially was not called to them by the council?

WITNESS: I can't recollect. I would have to go and make an examination before I could answer the question. I can't recollect it.

Q. Was there any need for an increase of supply of water in '95?

A. I don't think so. I think there was plenty.

Q. Why did you buy this property then to increase the supply?

A. Our own wish. We wanted to increase the supply and

314 we wanted to satisfy everybody. We were perfectly willing to make these improvements.

Q. You mean to say that you would spend large sums of money unnecessary, that it?

A. Didn't think it was necessary as far as the contract was concerned. It was necessary for our own satisfaction.

Q. For your own satisfaction?

A. Yes, sir.

Q. You recognized the fact that these four inch mains were too small?

A. Yes; but we understood that they had been put in by order of council.

Q. How did you understand it?

A. Generally.

Q. It don't say so in the contract, does it?

A. No, I think not.

Mr. WIMBERLY: The contract speaks for itself. I don't think this witness is called upon to construe the contract.

Mr. MARTIN: My friend asked more witnesses than one about that contract time and again.

The MASTER: The contract speaks for itself.

Q. How did you get your information that they were put in there by order of the city: Did the city inform you that they had done it?

A. When it was brought up, it was stated that the city ordered the four inch mains.

Q. Who stated it?

A. I don't recollect. I think it was Mr. Garrard: You asked me who it was that stated the city had ordered the four inch mains?

The MASTER: Do you know who made that statement?

WITNESS: I say I think it was Mr. Garrard.

Q. You then didn't get it from the city officials?

315 A. No, I think not. I never talked to them about it.

Q. You recognized that they were too small and agreed to take them up, didn't you?

A. My superintendent says——

Q. (Interrupting.) Not talking about what your superintendent says?

A. I don't know much about it.

Q. You don't?

A. No, sir; I am not an expert.

Q. You would have taken them up and put them down larger if you had had more money—if you could have gotten the money?

A. Yes, if we had had plenty of money we would have taken them up.

Q. You would have enlarged your source of supply if you had had plenty of money?

A. Didn't think that was necessary.

Q. You would have done it, wouldn't you?

A. I don't know positively that we would; but I think we would have done it.

Q. Don't you think it would have been necessary?

A. No, I hardly think so. Has not been any demand. We supplied all the demand that has been asked for.

Q. You had a very severe drought in the Fall of '95, didn't you?

A. Yes, sir.

Q. Didn't the water get very low?

A. Yes, sir.

Q. The upper reservoir went dry, didn't it?

A. They control it, yes, sir. They have been leasing it for years and paying rent for it.

Q. That land is not plowed up?

A. No, sir.

Q. That's the upper reservoir?

A. That's the one we are speaking about.

Q. How is that water drawn, from the top of that reservoir?

A. Judge, I have not been out there in several years. They
343 used to have a canal or by-pass, whatever they call it; and when the pond is full it comes over the top of the dam into this by-pass and runs through a pipe into the lower pond. Used to.

Q. You mean it flows over into the by-pass?

A. Yes, sir.

Q. If they want to take the water over into the lower reservoir how do they take it out?

A. Through a pipe.

Q. That runs through here? (Indicating on photograph.)

A. I have not been there in 4 or 5 years.

Q. What's that upper reservoir used for?

A. I suppose storage—to keep plenty of water.

Q. Isn't it used for any other purpose?

A. Not that I know of.

Q. How is that upper reservoir used for the purpose of settling water that goes through it, explain that process?

A. Well, whenever they have a heavy rain—Mr. Long is their man out there, he shuts all the water out of the lower pond. If it was a very heavy rain he could not do it. Sometimes he could not do it. But ordinarily all the water was turned into the canal or by-pass and wasn't any water allowed to get into the lower reservoir, without it was an extra big rain, until it cleared. As I said awhile ago the water would go into the by-pass—into the canal, into the pipe and into the lower reservoir.

Q. Now are there any negro settlements close to the reservoir?

A. There is one in two or three hundred yards of it.

Q. None right at it?

The MASTER: Ask him if there are any settlements.

344 Q. I will ask you does that drainage there lead into the reservoir?

A. In a very heavy rain I expect it would, some of it.

Q. Ordinarily?

A. Ordinarily it leads—kind of a hill and some flat places, some of it might go through here down through the woods (Indicating). I really can't answer that question whether it goes back through the woods into the Hannah Branch or goes back down to the bridge.

Cross-examination.

(By Mr. MARTIN:)

Q. Mr. Monk, you say you lived close to it for a number of years?

A. Yes, sir; lived out there 3 or 4 years.

Q. Where do you live now?

A. I live over in Phenix City.

Q. Did you ever see the water low in those reservoirs?

A. Yes, sir.

Q. You have seen them empty?

A. I have seen the upper one empty, about. There was a little pond at the lower end of it.

Q. What would be the character of the water when it was in that low state?

A. I hardly know, Judge, what to say.

Q. Was it stagnant water?

A. There was a little water—I never saw it during the principal trouble here, I believe last year or the year before.

Q. Never saw it in 1902: Did you see it in '95?

345 A. I don't remember that I did. I have seen the upper pond when it was very low. I heard it went dry but I never saw it at that time.

Q. When it was down at the lowest you saw it, what was the character of the water, was it fit for use?

A. Well, I don't think it was. Now there was a little water coming in from what we call Hann-h's Branch all the time I saw it. I never saw that particular branch dried up. They say it did dry up but I never saw that.

Q. Did you ever notice any smell about it when it was down low that way?

A. No, sir. I have been around it and crossed over the bridge over the upper reservoir.

Q. You say you have never been up in there?

A. I say I have crossed it.

Q. Hasn't a good deal of that reservoir filled in within the last ten years?

A. The upper one?

Q. Yes?

A. Yes, sir.

Q. Has there or not been a great deal of weeds, grass and such growth in it?

A. In the water?

Q. On the sides?

A. Around the edges?

Q. Yes?

A. Yes, sir. I have crossed the upper reservoir on the bridge going on up there; but I don't know when I was at the lower reservoir. May have been 5 or 6 years, that is, right down to the pond.

Q. Up at the bridge where you used to cross it, the water used to extend a good deal North of that point, didn't it?

A. Yes, sir.

Q. Don't do it now?

346 A. Yes, backs up above the bridge now.

Q. Not near as far as it used to?

A. Well, not much difference. The pond has filled in a good deal. There is not as much water, not near as much water as there was 15 years ago.

Q. Not near as wide and not near as deep?
A. Nearly as wide but where it has filled in it is not near as deep.
Q. How was it filled up—what filled it up?
A. Can't answer that, unless it was the stuff from the branch and creek.
Q. Was it the washings that filled it up—the washings of sand?
A. Yes, like any other branch.
Q. Leaves, pine straw and things of that sort washing in there?
A. Yes, some pine straw over there on the place; but I don't know how that got in there.
Q. Well, up there near that bridge you can see the ground in places, can't you, where you used to could not?
A. Well, yes.
Q. Almost clear of water?
A. Well, no—You mean when the pond is full?
Q. Yes?
A. That I don't know. I have not been out there in some time. I used to be out there in the Fall and the pond was full and I never noticed whether you could see the ground or not.
Q. Did you see that water in 1902?
A. I believe I did.
Q. Was any water in there then?
A. I don't remember.
Q. Do you know the character of water that was furnished in Columbus in '95, during that Fall when it was dry?
347 A. A little plainer, Judge—ask the question again.
Q. Do you know the character of water furnished in the Fall of '95 when that upper reservoir went dry?
A. There was a good deal of complaint about the water, that's my recollection.
Q. Did you notice to see whether the complaint was just or not?

Objected to as inadmissible, on the ground that the same is hearsay.

Q. Did you see any of the water?
A. I suppose I did I don't remember. 1895 has been sometime back.

Mr. WIMBERLY: We ask your Honor to rule out what he said about the complaints of others.
The MASTER: Yes, that's ruled out.

Redirect examination.

(By Mr. GARRARD:)

Q. How far is this bridge you speak of above the dam of the upper reservoir: Isn't it considerable distance?
A. Yes, I suppose it is 300 yards, may be more.
Q. Isn't it considerable more than that?
A. I said it may be more.
Q. On that bridge, you can't see, in passing on that bridge what is down near the dam, could you?

A. No, sir; not right at the dam you can't.

Q. You could not tell in passing there whether there was water there near the dam or not?

A. At all times?

Q. Yes?

A. I answered, I remember I went out there—it has been
348 sometime ago, I don't remember the year, when there wasn't but a little water in the upper reservoir. In crossing at a rocky ford where Hannah's Branch empties into the pond, you could see a good deal of the upper reservoir.

Q. The water was running in Hannah's branch?

A. I never saw Hannah's Branch dry myself. I suppose it has been dry but I never was out there at the time.

Mr. WIMBERLY: We object to what he supposes.

The MASTER: What you know. He says he never saw it dry.

349 E. M. WHEAT, sworn by the complainant, testified as follows:

(By Mr. GARRARD:)

Q. Mr. Wheat, were you a druggist in Columbus on the 7th day of September, 1903?

A. Yes, sir.

Q. Of what company in Columbus?

A. You mean the firm?

Q. Yes?

A. Watson & Wheat Drug Company.

Q. At that time what position did Mr. Brigham hold in that company?

A. Mr. Brigham was employed by Watson & Wheat Drug Co. as a manufacturing chemist.

Q. Did you sterilize eight bottoles at the request of W. S. Greene, Receiver of the Columbus Water Works Company?

A. Personally I did not. Mr. Brigham did, who was in my employ.

Q. Did you all go together to the filtering plant of the Columbus Water Works Company on 17th Street?

A. Yes, sir.

Q. In the City of Columbus?

A. Yes, sir.

Q. Well, what did you do with those bottles?

A. Well at the request of Major W. S. Greene, I informed Mr. Brigham of what he wanted; and asked him to get up these bottles; to get some bottles that never had been used for anything and to see that they were thoroughly cleansed and sterilized; and that he wanted us to go to the water works plant up there and get the water, seal everything up, pack and ship them to the address he gave—I don't remember the address——

The MASTER: Shipped to where?

A. The address he gave us, I don't remember, some firm in
350 Baltimore.

Q. Well, did you cork these bottles and seal them?

A. Yes, sir; we did.
Q. Did you deliver them to the express company at Columbus?
A. Yes, sir.
Q. They were shipped to this address?
A. Yes, sir.
Q. In Baltimore?
A. Yes, sir.
Q. What is the address: Refresh your recollection by this affidavit, if you can?
A. F. M. Colston, 216 South Baltimore Street, Baltimore, Md.
Q. Who were they shipped to?
A. F. M. Colston, Baltimore.
Q. Did you give the street number at the same time?
A. 216 South Baltimore Street, Baltimore, Md.
Q. How did you get the water into these bottles?
A. Well, I will state the whole thing: After Major Greene told me what he wanted, I took the matter up with Mr. Brigham, made it clear to him what he wanted: that he wanted to get some water into some bottles that were perfectly clean; to have the bottles corked and sterilized, everything to be perfectly pure; and he asked us to get the water and make shipment of it. He gave me the address and then we attended to the matter. We sterilized the bottles and put them in a basket—corked the bottles first—corked them with a little absorbent cotton, which is the proper way to cork them, so as to keep them from filling with impure air—impure moisture or anything. We went up to the filter plant then and found
351 the man in charge and told him what we wanted. He told us all right. We got over on some steps, something of the kind and submerged the bottles in the water, drew the cork and allowed the bottles to fill and corked them under the water, put them in the basket and brought them to the store and sealed the bottles with paraffin wax. We took them—sent them to the express office, prepaid the charges on them to this address, Colston, 216 South Baltimore Street, Baltimore, Md. We took their receipt and sent the receipt and the bill for the bottles and the money we paid out for express charges to Major Greene.

Cross-examination.

(By Mr. Wimbish:)

Q. Did Mr. Greene tell you what he wanted?
A. Yes, sir.
Q. Told you when to come and get it?
A. Didn't tell me when to come. Told me at my leisure.
Q. You got it out of the clear water basin?
A. Yes, sir.
Q. How long have you been living in Columbus?
A. A little over 21 years.
Q. Have you noticed the character of water that has been furnished here in the last 21 years by the water works company?
A. Yes, sir.

Q. Have you used it?
A. Yes, sir.
Q. Have you a bath-tub?
A. Yes, sir.
Q. State what has been the character of the water at various times?
A. Well, I don't know that I could give the dates. Of course there have been times when there were serious complaints of
352 it. Personally, I did not like the water furnished us for quite awhile. As near as I can recollect, it was in the summer of '93, the water was then, I believe, worse than I ever saw it. At home it was very objectionable to us in the bathtub. It was very muddy at times; and I rigged me up a little apparatus down there so as to precipitate the mud and used it.

The MASTER: What year did you say that was?

A. The summer of—I said '93. I made a mistake: it was '92—1902.

Q. Did you notice conditions of that kind back in '95 along in those years during dry spells?

A. Can't say '95. There were times when the water was very muddy; but I never saw it so objectionable—never discovered any objectionable odor to it until the year, I think the summer of 1902, about the first time I really discovered it.

Q. It had a very offensive odor then, didn't it?
A. Yes, sir.
Q. Have you noticed this water since they have been using the filter plant?
A. Yes, sir.
Q. State whether or not that has always been clear in the bathtubs?

A. Since they got the filter plant thoroughly installed, as I understand it, I have not discovered any muddiness—any serious objection to it.

Q. Haven't you seen sediment in the bottom of the bathtubs and pitchers?

A. No, sir; not that I could say came from the water. Of
353 course a bathtub will get soiled sometimes, on the porcelain lining, it will show; but you can wash it off, porcelain, anything of that kind. I have never noticed any sediment in the water since they have had the filter plant.

Q. You say you are a chemist?
A. No, sir; I don't claim to be a chemist myself.

354 L. S. BRIGHAM, sworn by the complainant, testified as follows:

(By Mr. GARRARD:)

Q. You live in Columbus?
A. Yes, sir.
Q. Were you living in Columbus on the 7th day of September, 1903?
A. Yes, sir.

Q. What was your business at that time?
A. I was chemist, in charge of the manufacturing department of the Watson & Wheat Drug Co.
Q. Did you go anywhere at the request of Major W. S. Greene?
A. No, sir.
Q. At whose request did you go?
A. At Mr. Wheat's.
Q. Where did you go?
A. I went to what is known as the filter plant of the Water Works Company.

The MASTER: Wouldn't it shorten the matter if you would ask him if he heard Mr. Wheat's testimony and if he was the man referred to:

Q. Did you hear Mr. Wheat's testimony?
A. Yes, sir.
Q. Is that your testimony?
A. It is, sir.

The MASTER: So far as it affects his act.

Q. Did you sterilize those bottles?
A. I sterilized the bottles, stopped them perfectly and then we carried the bottles as Mr. Wheat has testified to the filter plant and there we filled them up, submerged them, and brought them back and sealed them and shipped them as he has testified.
Q. Is that the proper way to select water for the purpose of having it tested or a test made of the water?
A. If you are going to make a microscopical examination.
355 Q. Would it be correct to stick a bottle down in running water and get it full of water without stopping *it* in the manner you speak of to keep out the air of an unclean character?
A. No, sir; it would not be.

Cross-examination.

(By Mr. WIMBISH:)

Q. How long have you lived here?
A. One year.
Q. Only one year?
A. Yes, sir.
Q. You were not here in 1902?
A. No, sir.
Q. What time did you come here?
A. I think it was the 5th day of February, last year.
Q. What was the character of water served the people of Columbus when you came here?
A. Only used it in connection with my lab-atory work. There were times when it was somewhat muddy and it was necessary to filter it before using it.
Q. How long did it continue in that way: Did it continue until they put the filter in in July?
A. Yes.

Q. Any smell about the water?
A. I didn't notice any.
Q. You say you had to filter it to use it?
A. Yes.
Q. Was that water fit for domestic use when you got here?
A. I could not answer that question.
Q. You know what domestic use is, for drinking and cooking?
A. I should not like to use it on account of its muddiness at certain times. At other times it was somewhat clearer.
Q. Have you ever had any experience in analyzing water as a chemist?

A. I have done some, yes.
356 Q. You say you have?
A. Yes, sir.

Q. Is it your experience that filtration with sand and alum will take out all the impurities in the water?
A. I could not answer that question. I have not qualified as an expert. I am not testifying as a chemist.
Q. You then don't feel prepared to answer that question?
A. No, sir.

Redirect examination.

(By Mr. GARRARD:)

Q. Are you familiar with this water since the filter plant has been in operation?
A. I have noticed it by using it in the drug business, yes.
Q. What is your opinion of the water as furnished by the receiver through the filter?

Objected to on the ground that the witness stated that he was not an expert.

The MASTER: I don't understand that he asks it as an expert.

Mr. GARRARD: Not at all. I am asking about this particular water.

Q. Answer the question?
A. It is very satisfactory for the general purposes that I make use of it—very satisfactory.
Q. You use it in the drug business?
A. Manufacturing, yes.
Q. Doesn't that require a very pure quality of water?

The MASTER: What quality of water does it require? That's the proper question.

Q. What is the character of the water that requires?
357 A. I will have to explain that I am not now occupying the position that I did on the 7th of September. I am not now acting as a chemist for the Watson & Wheat Drug Company. I am in the drug business. I am selling drugs here.

Mr. GARRARD: Will your Honor allow us to tender these photographs in the event we do not find the others?

The MASTER: Any objection to that?

(No objection upon the part of the defense.)

Mr. GARRARD: We will want to tender the Charter of the Columbus Water Works Company.

(The said Charter will be found on pages 482-486, Volume No. 1.)

Mr. GARRARD: You will consider all the pleadings in, including the pleadings in the Receiver case also, the receiver's certificate and the exhibits attached. We would like to make a formal tender of them in evidence.

The MASTER: The original bill, answer, amended bill, and then the cross-bill and answer?

Mr. GARRARD: Yes, sir; and the bill foreclosing the mortgage; but I don't suppose it will be necessary to copy that bill foreclosing the mortgage.

Mr. WIMBERLY: You will agree for us to use the original bill foreclosing the mortgage as far as it is admissible?

Mr. MARTIN: Yes, sir.

358 Mr. WIMBERLY: We will make a formal tender of it so far as it is applicable.

(See volume No. 1 for pleadings etc. other than the pleadings in the receivership case, beginning on page 1.)

Mr. GARRARD: We will tender the tap in evidence.

(This being an iron tap with a card attached to it bearing the following: "From 4 inch tap on 6 inch pipe for Racine Hotel Elevator, 19 Nov., 1903. Cols. W. Wks. Co. W. S. Greene, Rec. 1st Ave. bet. 13 and 14 St. The 6 inch pipe laid in 1881 (Eighteen eighty one.)

Mr. GARRARD: I will state in my place that I do not know of anything else. There may be some little thing that I have overlooked.

Court here took a recess until February 24, 1904.

359 WEDNESDAY MORNING, *February* 24, 1904.

Court met pursuant to recess and the hearing was resumed.

Mr. GARRARD: Before going into any of the oral testimony, I want to call attention to an abstract of the 12 census, this book, giving the population of the City of Columbus in 1900, and 1890, the official census. The official census in 1890 is 17,303; and the official census in 1900 is 17,614.

Mr. MARTIN: What was the census in 1880?

Mr. GARRARD: I have not it for 1880.

Mr. WIMBERLY: That can be gotten up.

Mr. GARRARD: I would be perfectly willing for it to be gotten.

The MASTER: There is no objection that evidence, is there?

Mr. WIMBERLY: Your own pleadings refer to the figures; but I don't suppose there is any better way to get it than the census itself.

The MASTER: Any objection to that?

Mr. WIMBISH: No, sir.

The MASTER: It is unnecessary to go into the formal proof of that if you admit that is true. Are these figures accepted by the other side as true?

Mr. WIMBISH: Yes, sir. We want the figures for 1880.

The MASTER: The only part I want to inquire about now is, whether you will require strict formal proof of that, such as proof of the book, page, date and all those sort of things?

Mr. WIMBISH: No, sir.

360 W. S. GREENE, recalled by the complainant, testified as follows:

(By Mr. WIMBERLY:)

Q. Major, you have in your hand a statement which you have furnished at the request of counsel for the defense in this case?

A. Yes, sir; as far as——

Q. (Interrupting.) I wanted to ask you a few questions in explanation: The second sheet, the one that shows the quantities of water—the one that is now before you, by months: The first column is headed at the top "wash water?"

A. From filters.

Q. From filters?

A. After washing returns to the river by sewer.

Q. Explain what you mean by that?

A. There is an arrangement connected with the filters where the wash water, instead of being——

Mr. WIMBISH (Interrupting.) I submit the Major has explained all this in his original testimony.

Mr. WIMBERLY: He is explaining these figures.

Mr. WIMBISH: That's already in the record.

The MASTER: I think Major Greene went over that pretty fully.

Mr. WIMBERLY: I don't mean to do anything more than explain the columns.

WITNESS: May it please your Honor, let me explain this in my own way. I can explain it in a moment. For instance: we pump from the river and we pump from the reservoir. The water comes from the reservoir through a 12 inch pipe and the water that comes from the river through a nine inch pipe. The water that
361 comes from the reservoir and the water that comes from the river passes into the settling basin. That water is mixed and passes through the filters into the clear water tank; and it is pumped from the clear water basin for the purpose of washing out the filters. After it has done its duty, has washed them out, it goes back into the river. It is a composition of river water and reservoir water; and if your Honor will take a piece of paper and a pencil a minute, you will see—I will give you the figures and you will see for yourself how the thing operates. In the month of October, I pumped 29,367,580 gallons from the reservoir; and at the same time 5,749,649 gallons were pumped from the river. You will please add those two quantities up. During that month there was used in wash-water, 4,034,992; and that leaves the amount that goes into the mains of the city for the purpose of furnishing the city with water. The percentage of river water can not be gotten positively because

it is all mixed together. Out of 31,000,000 gallons supplied to the city, 5,749,649 came from the river.

The MASTER: Then you have 31,000,000 gallons *sat* during the month of October that went through or was used by the city that was a composition of river and reservoir water, but four millions of that total went back as waste water, making thirty one millions of the mixture: You say you can't get at the percentage of river water?

A. No, because 5,749,649 gallons came from the river and
362 29,367,580 came from the reservoir. Those two added together——

Q. That would give the percentage; but what I want to get at is what the proportion of waste is——

A. (Interrupting.) The waste is in the same proportion. Bound to be the same, because it is all mixed water before it goes into the clear water basin.

Q. Is it washed at such intervals during the day so as to get the same average as that goes into the mains: When it is washed out during the day at cer- times, is it more largely river water or reservoir water?

A. No difference. It is mixed with the reservoir water and filtered and comes out as clear water and then used for washing.

Q. The percentage would be approximately the same?

A. All the way through.

The MASTER: I don't understand how you get the percentage?

WITNESS: You can get the percentage that way, sir.

Q. In the statement you have furnished here you have given the figures for October: In the months subsequent to October there is a very considerable deduction or reduction in the quantity of river water, being in November: 946,835 gallons; and in December it drops still further to 389,443—in fact there is not a month after October that there is as much as a million gallons, Nov. being the highest: How do you account for that?

A. Because in the meantime we had taken the 12 inch pipe off the upper bridge and straightened out—knocked out half a dozen right angles and turns in it and reduced the friction, making
363 a 12 inch connection instead of an eight inch connection, which prior to that time was an eight inch connection. Now we have a 12 inch connection all the way through from the reservoir by the former straight lines that we obtained before the bridge broke. That 12 inch pipe goes clear to the reservoir and no break in the 12 inch main now to the plant. Used to come in as an eight inch; but now comes in as a 12 inch.

Q. You mean with reference to the filter plant?

A. Yes, the settling basin.

Q. Your statement begins in October?

A. Yes, sir; we use engines with counters which keeps a record of the number of strikes and gives us the amount of water pumped.

Q. Back of that time were you able to give the quantities from the river and from the reservoir?

A. Can not from the reservoir but can give them to you from the river because they kept them at the power house of the Columbus Railroad Company where we were getting our supply of river water.

Q. These pencil figures at the bottom of this paper, does that give the river water?

A. That gives the river water.

Q. State those figures?

A. In July, 1,977,289.

Q. That all river water?

A. All river water.

Q. July of last year?

A. Yes, sir.

364 Q. The year?

A. July, 1903.

Q. August?

A. 11,221,197.

Q. September?

A. 9,233,920. These figures were furnished by the Columbus Railroad Co., where they produce the power at the City Mills.

Q. You have explained why after November the quantity was very much lower than it has been since Nov. was on account of the pipe?

A. Yes, sir.

Q. Have you any record of this for February as far as the month has gone?

A. Yes, sir.

Q. Of course you can't give it for the full month?

A. Give it up to the present time.

Q. Have you got the figures with you?

Objected to as irrelevant and objection overruled.

Mr. WIMBERLY: If you can I wish you would give the figures up to date.

WITNESS: I can get them by going over to my office.

Mr. WIMBIGH: We object to any statement or evidence coming in for the month after the 4th of February.

Q. What is this?

A. This is a daily statement, which is made every morning.

Mr. WIMBISH: Of course our objection extends to this paper.

The MASTER: I understand. I think he can examine him on it up to date.

WITNESS: This is my daily record, the only one I have got. If I leave this I will be out of a daily record. If you will allow

365 me to go to my office I can copy it.

Mr. WIMBERLY: We will withdraw it for the time being.

(Complainant here stated that they had the papers called for by the defendants' counsel (Mr. Wimbish), from witnesses: W. S. Greene, E. H. Epping and G. T. Preer, which appear in Volume No. 1 of this record.)

366 J. M. McCandless, sworn by the complainant, testified as follows:

(By Mr. Wimberly:)

Q. What is your profession?
A. Chemist—analytical chemist.
Q. What office do you hold?
A. That of State Chemist.
Q. You have been in the office of State Chemist how long—You have been State Chemist how long?
A. For the past 4½ years.
Q. Will you look at this analysis—this is a copy I believe we agreed to use in the place of the original?
A. Yes, sir.
Q. I will get you to state whether or not that is a correct analysis of the water that was sent on to you for examination?
A. Yes, this seems to be a copy of the same analysis I made for the Columbus Water Works Company. (See page 371, Vol. 1.)
Q. Who got you to make that analysis?
A. The Columbus Water Works Company.
Q. Can you refresh your recollection from the analysis itself and say what time it was you made it?
A. It was about the first part of September. Sept. 3 it is dated.
Q. What year?
A. 1903.
Q. The paper you have in your hand correctly sets forth the ingredients of the water?
A. Yes, sir.
Q. From the analysis of this water, what would you say as to its qualities for drinking and domestic purposes?

367 A. I would say that it was excellent water, suitable for all domestic and drinking purpose- and manufacturing purposes.

Q. At another time did you make this analysis of August 17, I believe, that is attached to the affidavit of Dr. Bullard?
A. Yes, sir.
The Master: That the same year?
A. Yes, sir; Aug. 17, 1903.
Q. Do you remember how that water referred to in the analysis of August 17, 1903, came to you—I mean the receptacle it was in?
A. Yes, sir; I remember it came to me in a jug, a large stone jug, probably had a capacity of about five gallons.
Q. What about the stopper—How was it stopped up?
A. On opening the jug for analysis, I noticed the stopper. It seemed to be old and it had an odor about it that suggested vinegar, as though it might have been used in a vinegar jug.
Q. Doctor, I will ask you if a stone jug, the kind that was used, such a thing suitable to put water in?
A. To send water in, no, sir; I do not so consider it.
Q. To be analyzed?
A. No, sir.

Q. Explain how a receptacle may absorb impurities and render it impure?

A. I don't consider that a jug is a proper vessel to send a sample of water in to a chemist for analysis.

Q. In order that we may have it in the record, explain why a jug is not a proper vessel for such purposes.

A. Simply because it is not transparent. Can't see whether the jug is clean or not. A man may rinse out a jug and imagine
368 it is clean but he won't know it. He can't see whether it is clean or not. I frequently analyze water sent to me in jugs, and while a great many were not impaired by being sent in a jug, in others I have found considerable quantity of molasses; and the party would tell me, when I reported adversely on the water, which I attributed to the jug itself, he would say "I cleaned the jug out and know it was clean." I would tell him: you thought you did but it was not; because there was molasses in the jug. You know that thick molasses standing in a jug a long time mere rinsing won't clean it.

Q. If the jug contained impurities other than molasses, it would have the same effect?

A. Yes, would be very liable to have the same effect.

Q. I will ask you doctor, if you ever called Dr. Bullard's attention to the suitableness or unsuitableness of the receptacle?

A. Yes, sir; when I mailed the analysis to Dr. Bullard at the same time I wrote him a letter and mentioned the fact.

Mr. MARTIN: We object to that. I presume that letter can be obtained.

Mr. WIMBERLY: Now in the interest of time: Mr. McCandless does not live here and I don't know whether Dr. Bullard has preserved the letter or not. If the gentlemen will permit us to ask the question, we will serve the proper writ upon Dr. Bullard to produce the original. If we can't produce it of course we will consent for this to be ruled out. In the event it is lost and we can not
369 get the original, I would like to save having to re-call the doctor in rebuttal. He is a non-resident.

(Here counsel for the complainant and the defense had a conference.)

Mr. WIMBERLY: With the understanding that it don't go in unless we satisfactorily account for the loss of the original letter—of course if we get the original all this goes out or if we fail to account for the original it goes out.

Mr. WIMBISH: We will endeavor to get the letter. We will produce the letter if it can be gotten.

Mr. WIMBERLY: Suppose the doctor has not preserved the letter?

The MASTER: We will see whether he has or not. Let's go on some other line. Have you sent for the letter?

Mr. WIMBISH: Yes, sir.

Q. Without going into the contents of the letter, you did write such a letter?

A. I did write such a letter, yes.

Q. Subsequent to the writing of that letter, were you called upon by any one on behalf of the City of Columbus to give an affidavit to that analysis?

A. Yes, sir. There was a gentleman that came into my office sometime in September—early in September. He introduced himself but I forget his name now. I remember that he said he was with the firm of Wimbish & Ellis; and asked me to make an affidavit to the analysis which I had made for Dr. Bullard, and swear
370 to its accuracy, etc.; and seeing that he was an attorney, why of course I presumed that there was some trouble about it. I then recited to him the facts in the case, about the condition in which the water was received, the character of the vessel in which it was received and the fact that I had written a letter to Dr. Bullard at the time I mailed him the analysis, calling his attention to the fact that the jug was an unsuitable vessel to send water in; and that the stopper had a suspicious odor of vinegar. I told him that I would be perfectly willing to make the affidavit which he requested; but if I did so that I must incorporate in the affidavit the statement of fact that I had written such a letter to Dr. Bullard. He then asked to show him a copy of the analysis I had sent to Dr. Bullard. I did so; and he sat down in my office and made a copy of it. He said that in case his principals desired the affidavit as I insisted on making it, he would let me know.

Q. So you declined to make the affidavit?

A. I declined to make the affidavit without stating the character of the letter I had written. He asked me at the same time if I had a copy of the letter. I looked and found that I had no copy of it: and re-called then that I had not made a copy of the letter.

Q. After that were you called on to make an affidavit with that modification?

A. No, sir; I was not.

Q. You heard nothing further from it?

A. I heard nothing further.

Q. Doctor, you testified as to the copy: This is the original: We found the original?

371 The MASTER: That the analysis he first testified about.

Mr. WIMBERLY: September 3. We agreed to use the copy.

WITNESS: This is the analysis made for the Columbus Water Works Company.

Q. The first one you testified to was a copy?

A. Yes, sir.

Q. This is the original analysis?

A. Yes, sir.

(See pages 371 and 372, Volume No. 1 of this record.)

Q. You testified from a copy: The original I showed you that is a correct analysis of the water?

A. Yes, sir.

Mr. WIMBERLY: This is in rebuttal, merely to save bringing the witness back; and all this will be excluded if they don't offer it, said

analysis being dated Aug. 17, 1903, and being the analysis attached to the affidavit of L. H. Chappell, identified in that way. I believe there is another one of the same date:

Q. You made that analysis, did you?

A. Yes, sir.

Q. Did you make that statement: "I judge from the above analysis that the water marked "from the lower reservoir" is unfit for drinking purposes. It is probable, however, that filtration, either chemical or by the sand-bed method, will so improve its quality as to make it suitable for a city water supply": Was that filtered or unfiltered water?

A. It was unfiltered water.

Q. You speak of filtration making it fit: The kind of impurities that you found in this water, were they solids and the like, such as filtration would remove from the water?

372 A. Yes, a large proportion of them.

Q. Do you know of your own knowledge where they got that sample from?

A. No, know nothing of that.

By the MASTER: My recollection is that there were two analysis made of this water, from the previous examination of this witness. One was for the City of Columbus——

Mr. WIMBERLY: Three.

Mr. WIMBISH: One for the City of Columbus which he has testified to and two by Baltimore chemists.

The MASTER: He did not testify to those.

Mr. WIMBERLY: These are attached together in the same paper. Two papers but three analysis.

Cross-examination.

(By Mr. WIMBISH:)

Q. Are you acquainted with the method of filtration of water?

A. Yes, sir.

Q. Which do you consider the better, the chemical or the mechanical?

A. Well, that is a matter that would be largely determined by conditions. Mechanical filtration will purify water and make it suitable for drinking purposes and so will the sand-bed method. The mechanical method is better adapted to the smaller cities or communities which do not require so extensive installation as the sandbed method. One probably is about as good as the other.

Q. Is there any difference in the two systems in the removal of disease germs?

A. It would be hard to make a very general statement about that. The mechanical method removes disease germs, so does the sand-bed method. The sand-bed properly cared for and attended to is

373 possible more efficient in the removal of disease germs than the mechanical method; but an improperly cared for sand-bed filter would not be as complete as the mechanical.

Q. Are you familiar with the system that is installed here?

A. They control it, yes, sir. They have been leasing it for years and paying rent for it.

Q. That land is not plowed up?

A. No, sir.

Q. That's the upper reservoir?

A. That's the one we are speaking about.

Q. How is that water drawn, from the top of that reservoir?

A. Judge, I have not been out there in several years. They
343 used to have a canal or by-pass, whatever they call it; and when the pond is full it comes over the top of the dam into this by-pass and runs through a pipe into the lower pond. Used to.

Q. You mean it flows over into the by-pass?

A. Yes, sir.

Q. If they want to take the water over into the lower reservoir how do they take it out?

A. Through a pipe.

Q. That runs through here? (Indicating on photograph.)

A. I have not been there in 4 or 5 years.

Q. What's that upper reservoir used for?

A. I suppose storage—to keep plenty of water.

Q. Isn't it used for any other purpose?

A. Not that I know of.

Q. How is that upper reservoir used for the purpose of settling water that goes through it, explain that process?

A. Well, whenever they have a heavy rain—Mr. Long is their man out there, he shuts all the water out of the lower pond. If it was a very heavy rain he could not do it. Sometimes he could not do it. But ordinarily all the water was turned into the canal or by-pass and wasn't any water allowed to get into the lower reservoir, without it was an extra big rain, until it cleared. As I said awhile ago the water would go into the by-pass—into the canal, into the pipe and into the lower reservoir.

Q. Now are there any negro settlements close to the reservoir?

A. There is one in two or three hundred yards of it.

Q. None right at it?

The MASTER: Ask him if there are any settlements.

344 Q. I will ask you does that drainage there lead into the reservoir?

A. In a very heavy rain I expect it would, some of it.

Q. Ordinarily?

A. Ordinarily it leads—kind of a hill and some flat places, some of it might go through here down through the woods (Indicating). I really can't answer that question whether it goes back through the woods into the Hannah Branch or goes back down to the bridge.

Cross-examination.

(By Mr. MARTIN:)

Q. Mr. Monk, you say you lived close to it for a number of years?

A. Yes, sir; lived out there 3 or 4 years.

Q. Where do you live now?

A. I live over in Phenix City.

Q. Did you ever see the water low in those reservoirs?

A. Yes, sir.

Q. You have seen them empty?

A. I have seen the upper one empty, about. There was a little pond at the lower end of it.

Q. What would be the character of the water when it was in that low state?

A. I hardly know, Judge, what to say.

Q. Was it stagnant water?

A. There was a little water—I never saw it during the principal trouble here, I believe last year or the year before.

Q. Never saw it in 1902: Did you see it in '95?

345 A. I don't remember that I did. I have seen the upper pond when it was very low. I heard it went dry but I never saw it at that time.

Q. When it was down at the lowest you saw it, what was the character of the water, was it fit for use?

A. Well, I don't think it was. Now there was a little water coming in from what we call Hann-h's Branch all the time I saw it. I never saw that particular branch dried up. They say it did dry up but I never saw that.

Q. Did you ever notice any smell about it when it was down low that way?

A. No, sir. I have been around it and crossed over the bridge over the upper reservoir.

Q. You say you have never been up in there?

A. I say I have crossed it.

Q. Hasn't a good deal of that reservoir filled in within the last ten years?

A. The upper one?

Q. Yes?

A. Yes, sir.

Q. Has there or not been a great deal of weeds, grass and such growth in it?

A. In the water?

Q. On the sides?

A. Around the edges?

Q. Yes?

A. Yes, sir. I have crossed the upper reservoir on the bridge going on up there; but I don't know when I was at the lower reservoir. May have been 5 or 6 years, that is, right down to the pond.

Q. Up at the bridge where you used to cross it, the water used to extend a good deal North of that point, didn't it?

A. Yes, sir.

Q. Don't do it now?

346 A. Yes, backs up above the bridge now.

Q. Not near as far as it used to?

A. Well, not much difference. The pond has filled in a good deal. There is not as much water, not near as much water as there was 15 years ago.

Q. Not near as wide and not near as deep?
A. Nearly as wide but where it has filled in it is not near as deep.
Q. How was it filled up—what filled it up?
A. Can't answer that, unless it was the stuff from the branch and creek.
Q. Was it the washings that filled it up—the washings of sand?
A. Yes, like any other branch.
Q. Leaves, pine straw and things of that sort washing in there?
A. Yes, some pine straw over there on the place; but I don't know how that got in there.
Q. Well, up there near that bridge you can see the ground in places, can't you, where you used to could not?
A. Well, yes.
Q. Almost clear of water?
A. Well, no—You mean when the pond is full?
Q. Yes?
A. That I don't know. I have not been out there in some time. I used to be out there in the Fall and the pond was full and I never noticed whether you could see the ground or not.
Q. Did you see that water in 1902?
A. I believe I did.
Q. Was any water in there then?
A. I don't remember.
Q. Do you know the character of water that was furnished in Columbus in '95, during that Fall when it was dry?
347 A. A little plainer, Judge—ask the question again.
Q. Do you know the character of water furnished in the Fall of '95 when that upper reservoir went dry?
A. There was a good deal of complaint about the water, that's my recollection.
Q. Did you notice to see whether the complaint was just or not?

Objected to as inadmissible, on the ground that the same is hearsay.

Q. Did you see any of the water?
A. I suppose I did I don't remember. 1895 has been sometime back.

Mr. WIMBERLY: We ask your Honor to rule out what he said about the complaints of others.
The MASTER: Yes, that's ruled out.

Redirect examination.

(By Mr. GARRARD:)

Q. How far is this bridge you speak of above the dam of the upper reservoir: Isn't it considerable distance?
A. Yes, I suppose it is 300 yards, may be more.
Q. Isn't it considerable more than that?
A. I said it may be more.
Q. On that bridge, you can't see, in passing on that bridge what is down near the dam, could you?

A. No, sir; not right at the dam you can't.

Q. You could not tell in passing there whether there was water there near the dam or not?

A. At all times?

Q. Yes?

A. I answered, I remember I went out there—it has been
348 sometime ago, I don't remember the year, when there wasn't but a little water in the upper reservoir. In crossing at a rocky ford where Hannah's Branch empties into the pond, you could see a good deal of the upper reservoir.

Q. The water was running in Hannah's branch?

A. I never saw Hannah's Branch dry myself. I suppose it has been dry but I never was out there at the time.

Mr. WIMBERLY: We object to what he supposes.

The MASTER: What you know. He says he never saw it dry.

349 E. M. WHEAT, sworn by the complainant, testified as follows:

(By Mr. GARRARD:)

Q. Mr. Wheat, were you a druggist in Columbus on the 7th day of September, 1903?

A. Yes, sir.

Q. Of what company in Columbus?

A. You mean the firm?

Q. Yes?

A. Watson & Wheat Drug Company.

Q. At that time what position did Mr. Brigham hold in that company?

A. Mr. Brigham was employed by Watson & Wheat Drug Co. as a manufacturing chemist.

Q. Did you sterilize eight bottoles at the request of W. S. Greene, Receiver of the Columbus Water Works Company?

A. Personally I did not. Mr. Brigham did, who was in my employ.

Q. Did you all go together to the filtering plant of the Columbus Water Works Company on 17th Street?

A. Yes, sir.

Q. In the City of Columbus?

A. Yes, sir.

Q. Well, what did you do with those bottles?

A. Well at the request of Major W. S. Greene, I informed Mr. Brigham of what he wanted; and asked him to get up these bottles; to get some bottles that never had been used for anything and to see that they were thoroughly cleansed and sterilized; and that he wanted us to go to the water works plant up there and get the water, seal everything up, pack and ship them to the address he gave—I don't remember the address——

The MASTER: Shipped to where?

A. The address he gave us, I don't remember, some firm in
350 Baltimore.

Q. Well, did you cork these bottles and seal them?

A. Yes, sir; we did.
Q. Did you deliver them to the express company at Columbus?
A. Yes, sir.
Q. They were shipped to this address?
A. Yes, sir.
Q. In Baltimore?
A. Yes, sir.
Q. What is the address: Refresh your recollection by this affidavit, if you can?
A. F. M. Colston, 216 South Baltimore Street, Baltimore, Md.
Q. Who were they shipped to?
A. F. M. Colston, Baltimore.
Q. Did you give the street number at the same time?
A. 216 South Baltimore Street, Baltimore, Md.
Q. How did you get the water into these bottles?
A. Well, I will state the whole thing: After Major Greene told me what he wanted, I took the matter up with Mr. Brigham, made it clear to him what he wanted; that he wanted to get some water into some bottles that were perfectly clean; to have the bottles corked and sterilized, everything to be perfectly pure; and he asked us to get the water and make shipment of it. He gave me the address and then we attended to the matter. We sterilized the bottles and put them in a basket—corked the bottles first—corked them with a little absorbent cotton, which is the proper way to cork them, so as to keep them from filling with impure air—impure moisture or anything. We went up to the filter plant then and found
351 the man in charge and told him what we wanted. He told us all right. We got over on some steps, something of the kind and submerged the bottles in the water, drew the cork and allowed the bottles to fill and corked them under the water, put them in the basket and brought them to the store and sealed the bottles with paraffin wax. We took them—sent them to the express office, prepaid the charges on them to this address, Colston, 216 South Baltimore Street, Baltimore, Md. We took their receipt and sent the receipt and the bill for the bottles and the money we paid out for express charges to Major Greene.

Cross-examination.

(By Mr. WIMBISH:)

Q. Did Mr. Greene tell you what he wanted?
A. Yes, sir.
Q. Told you when to come and get it?
A. Didn't tell me when to come. Told me at my leisure.
Q. You got it out of the clear water basin?
A. Yes, sir.
Q. How long have you been living in Columbus?
A. A little over 21 years.
Q. Have you noticed the character of water that has been furnished here in the last 21 years by the water works company?
A. Yes, sir.

Q. Have you used it?
A. Yes, sir.
Q. Have you a bath-tub?
A. Yes, sir.
Q. State what has been the character of the water at various times?
A. Well, I don't know that I could give the dates. Of course there have been times when there were serious complaints of
352 it. Personally, I did not like the water furnished us for quite awhile. As near as I can recollect, it was in the summer of '93, the water was then, I believe, worse than I ever saw it. At home it was very objectionable to us in the bathtub. It was very muddy at times; and I rigged me up a little apparatus down there so as to precipitate the mud and used it.

The MASTER: What year did you say that was?

A. The summer of—I said '93. I made a mistake: it was '92—1902.

Q. Did you notice conditions of that kind back in '95 along in those years during dry spells?

A. Can't say '95. There were times when the water was very muddy; but I never saw it so objectionable—never discovered any objectionable odor to it until the year, I think the summer of 1902, about the first time I really discovered it.

Q. It had a very offensive odor then, didn't it?
A. Yes, sir.
Q. Have you noticed this water since they have been using the filter plant?
A. Yes, sir.
Q. State whether or not that has always been clear in the bathtubs?

A. Since they got the filter plant thoroughly installed, as I understand it, I have not discovered any muddiness—any serious objection to it.

Q. Haven't you seen sediment in the bottom of the bathtubs and pitchers?

A. No, sir; not that I could say came from the water. Of
353 course a bathtub will get soiled sometimes, on the porcelain lining, it will show; but you can wash it off, porcelain, anything of that kind. I have never noticed any sediment in the water since they have had the filter plant.

Q. You say you are a chemist?
A. No, sir; I don't claim to be a chemist myself.

354 L. S. BRIGHAM, sworn by the complainant, testified as follows:

(By Mr. GARRARD:)

Q. You live in Columbus?
A. Yes, sir.
Q. Were you living in Columbus on the 7th day of September, 1903?
A. Yes, sir.

Q. What was your business at that time?
A. I was chemist, in charge of the manufacturing department of the Watson & Wheat Drug Co.
Q. Did you go anywhere at the request of Major W. S. Greene?
A. No, sir.
Q. At whose request did you go?
A. At Mr. Wheat's.
Q. Where did you go?
A. I went to what is known as the filter plant of the Water Works Company.

The MASTER: Wouldn't it shorten the matter if you would ask him if he heard Mr. Wheat's testimony and if he was the man referred to:

Q. Did you hear Mr. Wheat's testimony?
A. Yes, sir.
Q. Is that your testimony?
A. It is, sir.

The MASTER: So far as it affects his act.

Q. Did you sterilize those bottles?
A. I sterilized the bottles, stopped them perfectly and then we carried the bottles as Mr. Wheat has testified to the filter plant and there we filled them up, submerged them, and brought them back and sealed them and shipped them as he has testified.
Q. Is that the proper way to select water for the purpose of having it tested or a test made of the water?
A. If you are going to make a microscopical examination.
355 Q. Would it be correct to stick a bottle down in running water and get it full of water without stopping it in the manner you speak of to keep out the air of an unclean character?
A. No, sir; it would not be.

Cross-examination.

(By Mr. WIMBISH:)

Q. How long have you lived here?
A. One year.
Q. Only one year?
A. Yes, sir.
Q. You were not here in 1902?
A. No, sir.
Q. What time did you come here?
A. I think it was the 5th day of February, last year.
Q. What was the character of water served the people of Columbus when you came here?
A. Only used it in connection with my lab-atory work. There were times when it was somewhat muddy and it was necessary to filter it before using it.
Q. How long did it continue in that way: Did it continue until they put the filter in in July?
A. Yes.

Q. Any smell about the water?
A. I didn't notice any.
Q. You say you had to filter it to use it?
A. Yes.
Q. Was that water fit for domestic use when you got here?
A. I could not answer that question.
Q. You know what domestic use is, for drinking and cooking?
A. I should not like to use it on account of its muddiness at certain times. At other times it was somewhat clearer.
Q. Have you ever had any experience in analyzing water as a chemist?

A. I have done some, yes.
356 Q. You say you have?
A. Yes, sir.

Q. Is it your experience that filtration with sand and alum will take out all the impurities in the water?
A. I could not answer that question. I have not qualified as an expert. I am not testifying as a chemist.
Q. You then don't feel prepared to answer that question?
A. No, sir.

Redirect examination.

(By Mr. GARRARD:)

Q. Are you familiar with this water since the filter plant has been in operation?
A. I have noticed it by using it in the drug business, yes.
Q. What is your opinion of the water as furnished by the receiver through the filter?

Objected to on the ground that the witness stated that he was not an expert.

The MASTER: I don't understand that he asks it as an expert.

Mr. GARRARD: Not at all. I am asking about this particular water.

Q. Answer the question?
A. It is very satisfactory for the general purposes that I make use of it—very satisfactory.
Q. You use it in the drug business?
A. Manufacturing, yes.
Q. Doesn't that require a very pure quality of water?

The MASTER: What quality of water does it require? That's the proper question.

Q. What is the character of the water that requires?
357 A. I will have to explain that I am not now occupying the position that I did on the 7th of September. I am not now acting as a chemist for the Watson & Wheat Drug Company. I am in the drug business. I am selling drugs here.

Mr. GARRARD: Will your Honor allow us to tender these photographs in the event we do not find the others?
The MASTER: Any objection to that?

(No objection upon the part of the defense.)

Mr. GARRARD: We will want to tender the Charter of the Columbus Water Works Company.

(The said Charter will be found on pages 482-486, Volume No. 1.)

Mr. GARRARD: You will consider all the pleadings in, including the pleadings in the Receiver case also, the receiver's certificate and the exhibits attached. We would like to make a formal tender of them in evidence.

The MASTER: The original bill, answer, amended bill, and then the cross-bill and answer?

Mr. GARRARD: Yes, sir; and the bill foreclosing the mortgage; but I don't suppose it will be necessary to copy that bill foreclosing the mortgage.

Mr. WIMBERLY: You will agree for us to use the original bill foreclosing the mortgage as far as it is admissible?

Mr. MARTIN: Yes, sir.

358 Mr. WIMBERLY: We will make a formal tender of it so far as it is applicable.

(See volume No. 1 for pleadings etc. other than the pleadings in the receivership case, beginning on page 1.)

Mr. GARRARD: We will tender the tap in evidence.

(This being an iron tap with a card attached to it bearing the following: "From 4 inch tap on 6 inch pipe for Racine Hotel Elevator, 19 Nov., 1903. Cols. W. Wks. Co. W. S. Greene, Rec. 1st Ave. bet. 13 and 14 St. The 6 inch pipe laid in 1881 (Eighteen eighty one.)

Mr. GARRARD: I will state in my place that I do not know of anything else. There may be some little thing that I have overlooked.

Court here took a recess until February 24, 1904.

359 WEDNESDAY MORNING, *February* 24, 1904.

Court met pursuant to recess and the hearing was resumed.

Mr. GARRARD: Before going into any of the oral testimony, I want to call attention to an abstract of the 12 census, this book, giving the population of the City of Columbus in 1900, and 1890, the official census. The official census in 1890 is 17,303; and the official census in 1900 is 17,614.

Mr. MARTIN: What was the census in 1880?

Mr. GARRARD: I have not it for 1880.

Mr. WIMBERLY: That can be gotten up.

Mr. GARRARD: I would be perfectly willing for it to be gotten.

The MASTER: There is no objection that evidence, is there?

Mr. WIMBERLY: Your own pleadings refer to the figures; but I don't suppose there is any better way to get it than the census itself.

The MASTER: Any objection to that?

Mr. WIMBISH: No, sir.

The MASTER: It is unnecessary to go into the formal proof of that if you admit that is true. Are these figures accepted by the other side as true?

Mr. WIMBISH: Yes, sir. We want the figures for 1880.

The MASTER: The only part I want to inquire about now is, whether you will require strict formal proof of that, such as proof of the book, page, date and all those sort of things?

Mr. WIMBISH: No, sir.

360 W. S. GREENE, recalled by the complainant, testified as follows:

(By Mr. WIMBERLY:)

Q. Major, you have in your hand a statement which you have furnished at the request of counsel for the defense in this case?

A. Yes, sir; as far as——

Q. (Interrupting.) I wanted to ask you a few questions in explanation: The second sheet, the one that shows the quantities of water—the one that is now before you, by months: The first column is headed at the top "wash water?"

A. From filters.

Q. From filters?

A. After washing returns to the river by sewer.

Q. Explain what you mean by that?

A. There is an arrangement connected with the filters where the wash water, instead of being——

Mr. WIMBISH (Interrupting.) I submit the Major has explained all this in his original testimony.

Mr. WIMBERLY: He is explaining these figures.

Mr. WIMBISH: That's already in the record.

The MASTER: I think Major Greene went over that pretty fully.

Mr. WIMBERLY: I don't mean to do anything more than explain the columns.

WITNESS: May it please your Honor, let me explain this in my own way. I can explain it in a moment. For instance: we pump from the river and we pump from the reservoir. The water comes from the reservoir through a 12 inch pipe and the water that comes from the river through a nine inch pipe. The water that

361 comes from the reservoir and the water that comes from the river passes into the settling basin. That water is mixed and passes through the filters into the clear water tank; and it is pumped from the clear water basin for the purpose of washing out the filters. After it has done its duty, has washed them out, it goes back into the river. It is a composition of river water and reservoir water; and if your Honor will take a piece of paper and a pencil a minute, you will see—I will give you the figures and you will see for yourself how the thing operates. In the month of October, I pumped 29,367,580 gallons from the reservoir; and at the same time 5,749,649 gallons were pumped from the river. You will please add those two quantities up. During that month there was used in wash-water, 4,034,992; and that leaves the amount that goes into the mains of the city for the purpose of furnishing the city with water. The percentage of river water can not be gotten positively because

it is all mixed together. Out of 31,000,000 gallons supplied to the city, 5,749,649 came from the river.

The MASTER: Then you have 31,000,000 gallons *sat* during the month of October that went through or was used by the city that was a composition of river and reservoir water, but four millions of that total went back as waste water, making thirty one millions of the mixture: You say you can't get at the percentage of river water?

A. No, because 5,749,649 gallons came from the river and
362 29,367,580 came from the reservoir. Those two added together——

Q. That would give the percentage; but what I want to get at is what the proportion of waste is——

A. (Interrupting.) The waste is in the same proportion. Bound to be the same, because it is all mixed water before it goes into the clear water basin.

Q. Is it washed at such intervals during the day so as to get the same average as that goes into the mains: When it is washed out during the day at cer- times, is it more largely river water or reservoir water?

A. No difference. It is mixed with the reservoir water and filtered and comes out as clear water and then used for washing.

Q. The percentage would be approximately the same?

A. All the way through.

The MASTER: I don't understand how you get the percentage?

WITNESS: You can get the percentage that way, sir.

Q. In the statement you have furnished here you have given the figures for October: In the months subsequent to October there is a very considerable deduction or reduction in the quantity of river water, being in November: 946,835 gallons; and in December it drops still further to 389,443—in fact there is not a month after October that there is as much as a million gallons, Nov. being the highest: How do you account for that?

A. Because in the meantime we had taken the 12 inch pipe off the upper bridge and straightened out—knocked out half a dozen right angles and turns in it and reduced the friction, making
363 a 12 inch connection instead of an eight inch connection, which prior to that time was an eight inch connection. Now we have a 12 inch connection all the way through from the reservoir by the former straight lines that we obtained before the bridge broke. That 12 inch pipe goes clear to the reservoir and no break in the 12 inch main now to the plant. Used to come in as an eight inch; but now comes in as a 12 inch.

Q. You mean with reference to the filter plant?

A. Yes, the settling basin.

Q. Your statement begins in October?

A. Yes, sir; we use engines with counters which keeps a record of the number of strikes and gives us the amount of water pumped.

Q. Back of that time were you able to give the quantities from the river and from the reservoir?

A. Can not from the reservoir but can give them to you from the river because they kept them at the power house of the Columbus Railroad Company where we were getting our supply of river water.

Q. These pencil figures at the bottom of this paper, does that give the river water?

A. That gives the river water.

Q. State those figures?

A. In July, 1,977,289.

Q. That all river water?

A. All river water.

Q. July of last year?

A. Yes, sir.

364 Q. The year?

A. July, 1903.

Q. August?

A. 11,221,197.

Q. September?

A. 9,233,920. These figures were furnished by the Columbus Railroad Co., where they produce the power at the City Mills.

Q. You have explained why after November the quantity was very much lower than it has been since Nov. was on account of the pipe?

A. Yes, sir.

Q. Have you any record of this for February as far as the month has gone?

A. Yes, sir.

Q. Of course you can't give it for the full month?

A. Give it up to the present time.

Q. Have you got the figures with you?

Objected to as irrelevant and objection overruled.

Mr. WIMBERLY: If you can I wish you would give the figures up to date.

WITNESS: I can get them by going over to my office.

Mr. WIMBIGH: We object to any statement or evidence coming in for the month after the 4th of February.

Q. What is this?

A. This is a daily statement, which is made every morning.

Mr. WIMBISH: Of course our objection extends to this paper.

The MASTER: I understand. I think he can examine him on it up to date.

WITNESS: This is my daily record, the only one I have got. If I leave this I will be out of a daily record. If you will allow

365 me to go to my office I can copy it.

Mr. WIMBERLY: We will withdraw it for the time being.

(Complainant here stated that they had the papers called for by the defendants' counsel (Mr. Wimbish), from witnesses: W. S. Greene, E. H. Epping and G. T. Preer, which appear in Volume No. 1 of this record.)

356 J. M. McCANDLESS, sworn by the complainant, testified as follows:

(By Mr. WIMBERLY:)

Q. What is your profession?
A. Chemist—analytical chemist.
Q. What office do you hold?
A. That of State Chemist.
Q. You have been in the office of State Chemist how long—You have been State Chemist how long?
A. For the past 4½ years.
Q. Will you look at this analysis—this is a copy I believe we agreed to use in the place of the original?
A. Yes, sir.
Q. I will get you to state whether or not that is a correct analysis of the water that was sent on to you for examination?
A. Yes, this seems to be a copy of the same analysis I made for the Columbus Water Works Company. (See page 371, Vol. 1.)
Q. Who got you to make that analysis?
A. The Columbus Water Works Company.
Q. Can you refresh your recollection from the analysis itself and say what time it was you made it?
A. It was about the first part of September. Sept. 3 it is dated.
Q. What year?
A. 1903.
Q. The paper you have in your hand correctly sets forth the ingredients of the water?
A. Yes, sir.
Q. From the analysis of this water, what would you say as to its qualities for drinking and domestic purposes?
A. I would say that it was excellent water, suitable for all
367 domestic and drinking purposes and manufacturing purposes.
Q. At another time did you make this analysis of August 17, I believe, that is attached to the affidavit of Dr. Bullard?
A. Yes, sir.
The MASTER: That the same year?
A. Yes, sir; Aug. 17, 1903.
Q. Do you remember how that water referred to in the analysis of August 17, 1903, came to you—I mean the receptacle it was in?
A. Yes, sir; I remember it came to me in a jug, a large stone jug, probably had a capacity of about five gallons.
Q. What about the stopper—How was it stopped up?
A. On opening the jug for analysis, I noticed the stopper. It seemed to be old and it had an odor about it that suggested vinegar, as though it might have been used in a vinegar jug.
Q. Doctor, I will ask you if a stone jug, the kind that was used, such a thing suitable to put water in?
A. To send water in, no, sir; I do not so consider it.
Q. To be analyzed?
A. No, sir.

Q. Explain how a receptacle may absorb impurities and render it impure?

A. I don't consider that a jug is a proper vessel to send a sample of water in to a chemist for analysis.

Q. In order that we may have it in the record, explain why a jug is not a proper vessel for such purposes.

A. Simply because it is not transparent. Can't see whether the jug is clean or not. A man may rinse out a jug and imagine
368 it is clean but he won't know it. He can't see whether it is clean or not. I frequently analyze water sent to me in jugs, and while a great many were not impaired by being sent in a jug, in others I have found considerable quantity of molasses; and the party would tell me, when I reported adversely on the water, which I attributed to the jug itself, he would say "I cleaned the jug out and know it was clean." I would tell him: you thought you did but it was not; because there was molasses in the jug. You know that thick molasses standing in a jug a long time mere rinsing won't clean it.

Q. If the jug contained impurities other than molasses, it would have the same effect?

A. Yes, would be very liable to have the same effect.

Q. I will ask you doctor, if you ever called Dr. Bullard's attention to the suitableness or unsuitableness of the receptacle?

A. Yes, sir; when I mailed the analysis to Dr. Bullard at the same time I wrote him a letter and mentioned the fact.

Mr. MARTIN: We object to that. I presume that letter can be obtained.

Mr. WIMBERLY: Now in the interest of time: Mr. McCandless does not live here and I don't know whether Dr. Bullard has preserved the letter or not. If the gentlemen will permit us to ask the question, we will serve the proper writ upon Dr. Bullard to produce the original. If we can't produce it of course we will consent for this to be ruled out. In the event it is lost and we can not
369 get the original, I would like to save having to re-call the doctor in rebuttal. He is a non-resident.

(Here counsel for the complainant and the defense had a conference.)

Mr. WIMBERLY: With the understanding that it don't go in unless we satisfactorily account for the loss of the original letter—of course if we get the original all this goes out or if we fail to account for the oroginal it goes out.

Mr. WIMBISH: We will endeavor to get the letter. We will produce the letter if it can be gotten.

Mr. WIMBERLY: Suppose the doctor has not preserved the letter?

The MASTER: We will see whether he has or not. Let's go on some other line. Have you sent for the letter?

Mr. WIMBISH: Yes, sir.

Q. Without going into the contents of the letter, you did write such a letter?

A. I did write such a letter, yes.

Q. Subsequent to the writing of that letter, were you called upon by any one on behalf of the City of Columbus to give an affidavit to that analysis?

A. Yes, sir. There was a gentleman that came into my office sometime in September—early in September. He introduced himself but I forget his name now. I remember that he said he was with the firm of Wimbish & Ellis; and asked me to make an affidavit to the analysis which I had made for Dr. Bullard, and swear
370 to its accuracy, etc.; and seeing that he was an attorney, why of course I presumed that there was some trouble about it. I then recited to him the facts in the case, about the condition in which the water was received, the character of the vessel in which it was received and the fact that I had written a letter to Dr. Bullard at the time I mailed him the analysis, calling his attention to the fact that the jug was an unsuitable vessel to send water in; and that the stopper had a suspicious odor of vinegar. I told him that I would be perfectly willing to make the affidavit which he requested; but if I did so that I must incorporate in the affidavit the statement of fact that I had written such a letter to Dr. Bullard. He then asked to show him a copy of the analysis I had sent to Dr. Bullard. I did so; and he sat down in my office and made a copy of it. He said that in case his principals desired the affidavit as I insisted on making it, he would let me know.

Q. So you declined to make the affidavit?

A. I declined to make the affidavit without stating the character of the letter I had written. He asked me at the same time if I had a copy of the letter. I looked and found that I had no copy of it: and re-called then that I had not made a copy of the letter.

Q. After that were you called on to make an affidavit with that modification?

A. No, sir; I was not.

Q. You heard nothing further from it?

A. I heard nothing further.

Q. Doctor, you testified as to the copy: This is the original: We found the original?

371 The MASTER: That the analysis he first testified about.

Mr. WIMBERLY: September 3. We agreed to use the copy.

WITNESS: This is the analysis made for the Columbus Water Works Company.

Q. The first one you testified to was a copy?

A. Yes, sir.

Q. This is the original analysis?

A. Yes, sir.

(See pages 371 and 372, Volume No. 1 of this record.)

Q. You testified from a copy: The original I showed you that is a correct analysis of the water?

A. Yes, sir.

Mr. WIMBERLY: This is in rebuttal, merely to save bringing the witness back; and all this will be excluded if they don't offer it, said

analysis being dated Aug. 17, 1903, and being the analysis attached to the affidavit of L. H. Chappell, identified in that way. I believe there is another one of the same date:

Q. You made that analysis, did you?

A. Yes, sir.

Q. Did you make that statement: "I judge from the above analysis that the water marked "from the lower reservoir" is unfit for drinking purposes. It is probable, however, that filtration, either chemical or by the sand-bed method, will so improve its quality as to make it suitable for a city water supply": Was that filtered or unfiltered water?

A. It was unfiltered water.

Q. You speak of filtration making it fit: The kind of impurities that you found in this water, were they solids and the like, such as filtration would remove from the water?

372 A. Yes, a large proportion of them.

Q. Do you know of your own knowledge where they got that sample from?

A. No, know nothing of that.

By the MASTER: My recollection is that there were two analysis made of this water, from the previous examination of this witness. One was for the City of Columbus——

Mr. WIMBERLY: Three.

Mr. WIMBISH: One for the City of Columbus which he has testified to and two by Baltimore chemists.

The MASTER: He did not testify to those.

Mr. WIMBERLY: These are attached together in the same paper. Two papers but three analysis.

Cross-examination.

(By Mr. WIMBISH:)

Q. Are you acquainted with the method of filtration of water?

A. Yes, sir.

Q. Which do you consider the better, the chemical or the mechanical?

A. Well, that is a matter that would be largely determined by conditions. Mechanical filtration will purify water and make it suitable for drinking purposes and so will the sand-bed method. The mechanical method is better adapted to the smaller cities or communities which do not require so extensive installation as the sandbed method. One probably is about as good as the other.

Q. Is there any difference in the two systems in the removal of disease germs?

A. It would be hard to make a very general statement about that. The mechanical method removes disease germs, so does the sand-bed method. The sand-bed properly cared for and attended to is

373 possible more efficient in the removal of disease germs than the mechanical method; but an improperly cared for sand-bed filter would not be as complete as the mechanical.

Q. Are you familiar with the system that is installed here?

A. I suppose it is the mechanical method. I am familiar with the system as it is installed in Atlanta.

Q. As I understand it, the system here is a sand bed?

A. Is a sand-bed?

Q. And they may use alum also?

A. Use both?

Q. Use both alum and the sand: Would you call that a combination system?

A. Combination?

Q. Yes?

A. I should say it would be a combination system.

Q. Would either system remove germs of typhoid fever?

A. O, if it removed any sort of germ it would remove them. I should say if it removed any ordinary germ it would remove the germ of typhoid fever.

Q. Can you say to what extent it is efficacious in the removal of disease germs?

A. No, sir; I can't say. All microbes are practically about the same size. They are very minute and can only be seen under high power of the microscope. If one is removed, whether it be harmless or harmful, it is fair to presume that all would be removed.

Q. How long has this method of filtration been in practical use?

A. Well, I have known of the mechanical method being in use for the last 15 or 20 years. I have known of it that long of my own personal experience. I don't know just how much longer
374 than that—I think about 25 or 30 years it has been in use.

Q. What do you mean by the chemical method?

A. The method of precipitation by means of alum or sulphate of iron. You take water like the Chattahoochee River water, like we have it in Atlanta, it is turbid. The mud is suspended matter and when they filter it, they run a small stream of alum into it; and when the alum mixes with the water, a chemical reaction takes place between the sulphate of alumina and the carbonate of lime or magnesia contained in the water.

Q. Do I understand you to say that that method is practically as good as the other method?

A. Yes, I think it is.

Q. Suppose you have a water system, the capacity of the reservoir from which the water is drawn for use does not exceed 13,000,000 gallons, where the daily consumption will not exceed a million gallons, would it be practicable to use the chemical method of filtration?

A. In a system of that size I should say so.

Q. What effect would the running of pure water through impure pipes, that is, pipes in which there may be sediment impurities, have upon the water?

A. Well, of course if there were impurities in the pipes, the water would be contaminated by those impurities after it had been filtered.

Q. It being very difficult to get them clean, I understand from your answer the presence of these impurities in the pipes, apparently, would affect the quality of the water?

A. That is to say, as judged by an analysis. A chemist might condemn water as impure which was perfectly pure. For
375 instance: he makes up his verdict as to the character of the water from the amount of ammonia he finds in it, salt, etc. No harm in ammonia, *per se;* and no harm in salt. Take it in our food, large quantities every day. If a chemist finds much salt in water, it is an indication that sewerage matter may have had access to the water. If he finds much ammonia in the water, it is a clew that indicates that there is matter from some decomposed animal or vegetable matter, like a dead cat or a dog, has been in the water and the nitrogen in its tissues had been conveyed into the water by putrefaction. No harm in the ammonia itself but simply a clew.

Q. What impurity did you find — the water analyzed by you sent you by Dr. Bullard that caused you to condemn that water?

A. The principal thing that caused me to condemn that water was that it was not clear and bright. It was cloudy; and I judged from the fact that I had received at the same time a sample of water from Mayor Chappell, that I was analyzing water before it had been filtered and one after it had been filtered. The one from Mayor Chappell was very dirty and cloudy and muddy and the other, whilst it was a very much superior article to the one received from Mayor Chappell, still was not bright and clear. Also the figures for albuminoid ammonia in the water received from Dr. Bullard were higher than I was accustomed to find in water that I knew was filtered in Atlanta by the alum process; and therefore, I
376 judged that the filtration was imperfect. Either that or the water had been contaminated, without Dr. Bullard's knowledge, from his putting it into a jug which he could not see was clean.

Q. The presence of this ammonia in that sample of water, did that indicate that it might have come in contact with sewerage?

A. No, sir; there was not enough in it to indicate that. We also take into consideration other facts. For instance the amount of chlorine in the water, which indicated that the common salt was exceedingly low, which led me to believe or conclude that what ammonia was in the water did not come from sewerage matter. In point of fact, if you will read the remarks I made about that water, you will see I did not condemn that water. I simply said I can not recommend it simply on the side of conservatism. The figures I obtained would not justify me in condemning that water.

Q. If water, when drained into a receptacle or a bath-tub or a pitcher, and left standing over night, would deposit sediment after the water had been filtered, what would that indicate?

A. Well, it would indicate incomplete filtration.

Q. If the water before filtration was impure and the filtration incomplete, then the water, after it had been filtered, to that extent would be impure?

A. Yes, sir.

Q. Suppose that water left standing over night gave off an unpleasant odor, what would that indicate?

A. It would indicate probably it had been in contact with
377 some substance that generated such an odor.

Q. Does water, when running through pipes of a system if the water itself be impure, muddy, full of organic matter, deposit impurities in the pipes?

A. If the water itself be pure?

Q. No, if the water be impure?

A. Yes, I suppose it does. I have never examined any pipes; but I have heard that muddy water will deposit a thick crust on the inside of pipes.

Q. Suppose that you forced pure water through those pipes, would that water become contaminated?

A. Yes, to some extent, I should say. I think if pure water were pumped for a long time through pipes that had muddy crust in them, after awhile all of the impurities which it would be capable of taking up, would be practically removed. Mud, for instance, there is no harm in mud, clay, anything of that kind; but it is the organic substances that might be mixed with it.

Q. Washings from hillsides?

A. Yes, washings from hillsides is composed of mineral matter, clay, soil and small quantities of organic matter, animal microbes—germs that live in animals, which of course are harmful. So far as the clay mixing with the water except from being bad looking, has the least harm about it.

Q. Your analysis of the water that Dr. Bullard furnished you, from that analysis did you discover vinegar?

A. I only judged by the stopper.

Q. Would your analysis show vinegar if it were present?

378 A. If vinegar had been in that jug, my figures for albuminoid ammonia would have been higher than they otherwise were; because vinegar does contain a little nitrogen. The method I use in analyzing water frees any nitrogeneous matter that may be in the water, no matter from what source it comes.

Q. Did you find any impurities that came from the condition of the jug: Did your analysis discover any other impurities?

A. No, sir; I did not condemn the water. The water, so far as the analysis goes, some chemists might have passed the water and called it good water.

Q. What I am trying to get at is this: I want to see if your analysis discovered anywhere any impurity that you could trace to the jug itself?

A. No, no.

Q. And if your opinion is simply dependent upon the odor which you thought you detected in the stopper?

A. My opinion was dependent upon the odor which I thought I detected from the stopper, from the fact that the water came in a jug; because no one can tell when a jug is clean. He can't see. It is not transparent and he can't tell.

Q. So it is an inference on your part that the jug might have been dirty?

A. Might have been.

Q. You made that certificate to the analysis you sent Dr. Bullard: why did you decline to make an affidavit to that?

A. Why did I decline to make an affidavit?

Q. Yes?

A. Because the gentleman who called for the affidavit objected to my inserting in it the fact that the water had come in a jug;
379 and that I had written a letter to Dr. Bullard at the same time I mailed him the analysis.

Q. If you deemed that important, why didn't you put that in your certificate?

A. Because really it was an after thought. After I got through writing it out, the reason I didn't keep a copy of it really is this: I have no stenographer and being very busy in the lab-atory most of the time, when I make an analysis of this kind, I have got a typewriter in the office, I sit down and write it off myself on the typewriter and take a carbon copy; but I am no expert on the typewriter and I really prefer to write with a pen. I wrote off the analysis so I might have a copy to keep myself. But before sending it off thinks I, I better write a letter to Dr. Bullard and call his attention to the jug, there may be trouble about this water: is about the fact of it. I sat down and wrote him a letter with a pen and I have no idea that I kept a copy of it. I don't keep copies, as a rule, unless I think there is going to be some trouble.

Q. Doctor, assuming that the sample of water submitted to you by Mayor Chappell and analyzed by you under date of August 17 was taken from the lower reservoir before filtration; and further assuming that the sample furnished you by Dr. Bullard and analyzed under the same date was taken from the city mains after filtration, the filtration being by the combined chemical and mechanical process, explain why the free ammonia in the unfiltered water
380 should be only 0.07 parts per million, and after filtration it was 0.300?

A. You have just got it reversed. Before filtration it was 0.300. The sample received from Mayor Chappell was the unfiltered water.

Q. The filtration had reduced it?

A. Filtration had enormously reduced it.

Q. From 0.300?

A. To 0.07.

Q. And albuminoid ammonia from 0.23?

A. To 0.082.

Q. That due to filtration?

A. Yes, sir.

Q. Do you call that an abnormally large amount of free—albuminoid ammonia?

A. No, sir; it is not; and if that water had been clear and brilliant, I would have passed it as good water. As it was, I did not condemn it. I simply said I could not recommend it.

Q. The total solids before filtration were 56.00?

A. Yes, sir.

Q. And after filtration 46.00?

A. Forty six.

Q. Does that indicate complete filtration?

A. Well, total solids, I would like to explain, consists of two kinds of substances, suspended matters and dissolved matters. The suspended matter is the mud or any other dirt that may be in the water. Dissolved matter consists of carbonates of lime, magnesia, sodium chloride and anything like that. The water can be perfectly clear and yet contain large quantities of matters in solution. That water with 46.00 total solids, means matters in solution.

Q. Could not perfect filtration reduce those solids very much—I mean practically perfect?

381 A. It will reduce it very considerably, yes.

Q. Should it not reduce it more than was done in this case?

A. Well, I should think not; because that is a small amount. 46.00 parts per million, as you will see is 2.6826 grains per gallon. The average spring water throughout the country will contain from two *ro* five grains, although it be as brilliant as a crystal.

Q. This water before filtration contained only 3.2658 grains per gallon?

A. Yes.

Q. Why is it that spring water ordinarily would contain more solids than it seems this unfiltered water does?

A. Spring water is in the ground and it comes more thoroughly in contact with the minerals in the soil and meets up with more magnesia and other dissolved matters than water in a reservoir that comes merely from the surface. Reservoir water does not dissolve as much mineral matter as spring water.

Q. I notice the volatile and organic matter before filtration is 16.90?

A. A. Before filtration 16.90 and after filtration 16.00. It is reduced. Of course the amount of volatile and organic matter is small as compared with the other.

Q. Then the practical effect of filtration in this case has been to reduce the solids from 56. to 46?

A. Yes.

Q. And to reduce the free and albuminoid ammonia?

A. Yes, it has reduced them.

Q. It has had no*t* substantial effect on the volatile and organic matter?

A. Comparatively little.

382 Q. Very little on chlorine, hasn't it?

A. Would not be expected to have on chlorine. Chlorine is entirely soluble.

Q. What was taken out of this water by filtration? How much did that improve the water?

A. It improved it enormously. You will notice the things which have been largely reduced are the things which indicate organic impurity. For instance: 0.300 parts per million before it was filtered, has been reduced to 0.07. That shows that a large quantity of organic matter was removed from the water; and in the same way with reference to albuminoid ammonia. There is very little or none

of the chlorine removed from the water; and would not expect filtration to remove much of it. For instance: you can dissolve a pound of sugar in a gallon of water and filter it thoroughly and you will have your pound of sugar in the water just the same after filtration. The filter is not going to hold anything that is in solution.

Q. Does not remove anything in solution?

A. Does not remove anything that is in solution or that is capable of being dissolved. Salt is one of the things that would be dissolved and sugar would be dissolved. Ammonia is absorbed in the sand or charcoal; and things that produce the ammonia are removed, any decayed or vegetable matter, for instance, like a dead rat or a dead cat, anything of that kind would be taken out. Consequently, water after filtration would not show that.

Q. Now under what head would that kind of organic mat-
383 ter be that you speak of?

A. Nitrogen as nitrates, they refer to——

Q. I don't mean that: I say under what head—Now suppose there was animal matter or injurious animal or organic matter in the water, where would you place that?

A. Place that very likely under the head of albuminoid ammonia, nitrogen as nitrates and nitrogen as nitrites. They would all refer to organic matter in the water. If I were to make a complete analysis of water, I would test for carbonate of lime, carbonate of sodium and other minerals.

Q. What do you include in volatile and organic matter?

A. Volatile and organic matter would include any vegetable or animal matter.

Q. Doctor, I don't think you have answered my question: I want to know what is included in volatile and organic matter?

A. It is what goes off when the total solid matter in the water is heated, all the organic matter, vegetable or animal.

Q. Then this analysis showed that very little of that was removed by filtration in this case?

A. Sixteen as against sixteen and ninety one hundredths. That is something about which a chemist pays very little attention in making up his verdict on the character of the water. Sometimes it is put in. I happened to put it in because I wanted to see whether the stuff turned black when I heated it. You can tell by weighing the dish before and after what volatile matter has gone off. While it is boiling, before it gets down to dryness, a
384 great deal of that ammonia goes off in the steam and consequently you have not weighed that; and I would reach the same conclusion about that analysis without having the volatile and organic matter. In a great many cases I don't put it in.

Q. You base it upon the free and albuminoid ammonia?

A. Free and albuminoid ammonia and the chlorine. If the chlorine were to run up high, say 6 or 7 grains, that would change my whole opinion about the water.

Redirect examination.

(By Mr. WIMBERLY:)

Q. Doctor, they have asked you about what an odor in the water would indicate: Was there any odor in this water that you examined the sample of?

A. I could not smell any, no, sir. I could smell a little odor of vinegar, as I stated, on the stopper. That's the only odor I detected.

Q. If the staying over night would cause an odor, it would have had time for the odor to have manifested itself after it had been taken out of the system here before you had an opportunity to examine it: How long did you examine it—before you examined it after it was taken out of the system here?

A. Well, I don't know exactly. I suppose 2 or 3 days elapsed between the time it was taken here and the time I commenced my analysis of the sample.

Q. Do you remember whether you delayed the examination of it: have any recollection about it?

A. I think I went at it as soon as I could find time to do it.

385 Q. Do you remember whether you were requested to do it at once?

A. That's my recollection. That Dr. Bullard wrote me to do it as soon as possible. I think possibly 2 or 3 days, might have been more, between the time the sample was taken and the time I examined it.

Q. Doctor, they asked you about sediment in a bath-tub. Would that depend partly upon the condition of the bather, the condition of the water and the condition of the bather using it?

A. That would be hard to say.

Q. You speak of nitrogen as nitrates in this water as indicating any organic impurities that are regarded as deleterious: I will ask you whether the nitrogen as nitrates indicated the presence of such matter in any dangerous quantities?

A. No, sir: mere traces.

Q. I believe you say in arriving at the probable presence of deleterious matter, do you go by one of these traces or——

A. (Interrupting.) By the whole thing taken together.

Q. The proportion that one bears to the other aid you in determining that?

A. Yes. More stress is laid on the presence of nitrogen in any form than anything else. A large quantity of free and albuminoid ammonia indicates a very considerable quantity of organic matter.

Q. Was there any large quantities of nitrogen in either of these samples?

A. Only the first one sent by Mayor Chappell, the unfiltered water. The nitrogen was high and would condemn any water without going any further, that showed as large quantity of free and albuminoid ammonia as that water did?

Q. How was it as to the other sample?

A. Well, it was very much less.

386 Q. Those were per million parts, was it?

A. Yes, sir.

Q. Free ammonia showed 0.07 of one part in a million parts?
A. Seven pounds in a million pounds to express it definitely.
Q. Seven pounds in a million pounds?
A. Yes, sir.
Q. Nitrogen as nitrates and nitrogen as nitrites, traces: What do you mean by traces? What per cent. would that be?
A. You simply could not express it. The method of tracing for nitrogen as nitrates is the clearing method. You see mere traces by clearing corresponding to the presence of nitrogen as nitrates and as nitrites.
Q. On the matter of filtration in vogue: do you know how long the present mechanical method has been in use—mechanical filtration?
A. There are several of those methods; and I think they have been in practical, effective use for something like 25 or 30 years probably.
Q. From your experience are you able to say whether there has been considerable improvement in them in the last few years?
A. Well, sir; I don't know. I have not kept up with that.

Recross-examination.

(By Mr. WIMBISH:)

Q. I will let Dr. McCandless examine these analyses and identify them that I examined him on so that we can introduce them?
A. Yes, sir; that is the original analysis that I sent.
Q. And correctly sets forth the analysis as made by you?
387 A. Yes, sir.
Q. This one is dated August 17, 1903, sample of water received from L. H. Chappell, said to be from the lower reservoir, unfiltered?
A. Yes, sir.

The MASTER: That was subse-nt to the filing of this bill?
Mr. WIMBISH: Yes, sir.

Q. August 17, 1903, sample of water furnished by Dr. W. L. Bullard?
A. Yes, sir.
Q. That correctly sets forth the analysis you made?
A. Yes, sir.
The MASTER: The analysis you made for the water company was made in September, 1903?
A. Yes, sir; September 3rd it was dated.

388 T. N. KITCHEN, sworn by the complainant, testified as follows:

(By Mr. WIMBERLY:) We have no questions for him, except we have put in his affidavit.
Q. That correctly sets out the fact, doesn't it doctor?
A. Yes, sir; that's it. (Referring to affidavit.)

Cross-examination.

(By Mr. MILLER:)

Q. Did you get this water at the filter plant?
A. Yes, sir.
Q. From the clear water basin?
A. Yes, sir.
Q. After it had been filtered?
A. Yes, sir.
Q. You sealed it up and sent it to Mr. McCandless, the State Chemist?
A. Yes, I sealed it and came with the jug to the express office and turned it over to the Express Agent and had him to re-seal it also, the express agent.
Q. You sent that in a jug?
A. In a demijohn—glass demijohn.
Q. Did it have anything on the outside of it?
A. No, sir; I think it was perfectly transparent.
Q. See through it?
A. Yes, sir.
Q. How long have you been in Columbus?
A. Twelve years.
Q. What is the quality of water we have had in Columbus since you have been here?
A. It has been all qualities.
Q. Before the establishment of this filter plant by the Columbus Water Works Company?
A. Well, before that the quality at times was unfit for drinking purposes on account of the matters in suspension.
389 Q. Do you remember the times it was in that condition?
A. Yes, during the summer of 1902.
Q. What was the condition of the water at that time?
A. Well, it was full of mud and was unpalatable.
Q. Was it fit for domestic use?
A. No, sir; could not say it was for cooking purposes nor for bathing purposes even.
Q. How many months was the water unfit for domestic use?
A. I don't know, sir, 2 or 3 or 4—I don't know, did not keep any record of it.
Q. Do you remember any time previous to 1902 that it was unfit for use?
A. Frequently for a day at a time after heavy rains the water would be muddy.
Q. How about the Fall of '95 and '98 and 1901, wasn't there considerable periods of time in the Fall of those years that the water that we got from the Water Works reservoir was very unwholesome?
A. Well, it was unpalatable at times but I could not say it was unwholesome, because I drank it myself most of the time. Had to in self defense.
Q. You drank it without filtration?
A. Yes, sir.

Q. Had ice in it?
A. Yes, lowered the temperature of it.
Q. Did it have an odor?
A. Yes, frequently had an odor.
Q. What was its condition as to clearness?
A. At times it was real muddy and at times practically clear.
Q. Isn't it a fact that in most every dry season—Fall season, the water at that time became very foul and offensive to the smell?
A. Yes, sir.
Q. Did you regard it as fit water for domestic use at those times?
A. No, sir.

390 (By Mr. WIMBERLY:)

Q. Since the date of that analysis how has the water been?
A. All right.

391 E. H. EPPING, re-called by the complainant, testified as follows:

(By Mr. WIMBERLY:)

Q. This statement that you made up of the amounts expended for betterments to the plant of the Columbus Water Works Company, for the years 1891 to the first of July, 1902, inclusive, requested by defendants' counsel, that you now hold in your hand, is that a correct statement?
A. Yes, sir; taken from the books of the company.
Q. Mr. Epping, your statement, from the hurried examination I have been able to make of it, does not state the price of the pipe: Do you know what was paid for the pipe?
A. The best I could find out, sir—some of the invoices are missing. They are not there.
Q. Can you name the amount that would cover it?
A. Not for all of it, no, sir.
Q. What proportion of it can you?
A. Lots of it laid before I went in the office. I went there in '98. That is placed back to '91. This is a copy of the books from '91.
Q. Can you name an amount that is sufficiently large to cover the cost of the different pipe, that is, the dates, when it was bought, and the price?
A. No, sir; I could not.
Q. During what part of the time can you?
A. I went in the office in October, 1898. There are the invoices there pinned to the vouchers.
Q. As far as you have invoices what was it?
A. The prices varied from $17.90, I think it was, up to as high as $33 a ton.
392 Q. What is the present price?
A. Thirty three dollars I think is the lowest quotation we had delivered here.
Q. Thirty thousand feet, was there—was that about the quantity, I believe?

A. I think so, yes.
Q. What was the cost of that?
A. The invoices I have seen show $17.90 a ton.

The MASTER:

Q. How many tons in 30,000 feet?
A. About 500 of six inch pipe: about 60 feet to the ton. Runs about 400 pounds to a length of 12 feet. It comes in 12 foot lengths.
Q. Every 12 feet weighs 400 pounds, about that?
A. Yes, sir; about that. It will run about 60 feet to the ton.
Q. 60 feet to the ton, 30,000 feet: that would be 500 tons?
A. Yes, sir.

(By Mr. GARRARD:)

Q. This 30,000 feet of pipe that you speak *you*, do you refer to the pipe pile near the engine house, do you not?
A. That's some of the pipe.
Q. How long had that pipe been there before it was laid on Rose Hill and in the lower part of the city?
A. I don't know, sir.
Q. Wasn't it a considerable length of time?
A. I think it was. When I went to the office—I don't know.

Objected to as leading.

Q. That's the pipe you refer to as being on hand?
A. Yes, sir.
393 Q. Where was that pipe finally used?
A. That particular pipe?
Q. Yes?
A. I don't know, sir.
Q. Wasn't it used in the betterment and extension of this system?

Objected to as leading.
WITNESS: I could say it was used but I don't know the particular street it was laid on.

Q. I mean was it——

Objected to the form of the question.
The MASTER: Put your question in legal form.

Q. What would that same pipe be worth now?

Objected to as being irrelevant. Objection overruled.

Q. Was that pipe charged in at any greater value than $17.?
A. No, sir; it was not.
Q. Now at the time that pipe was used, do you recall the value of the pipe at the time it went in the ground?
A. Yes, sir; 1898 is when we paid $17.90 for pipe. The invoice I saw there was in '98.
Q. What did it get to be worth very soon after that?
A. As high as $33. a ton.

Objected to on the ground that witness does not state the date.
Mr. GARRARD: I am trying to get at the date.

The MASTER: You can ask him this question: At the time the company put this pipe into the ground, had not the price of pipe very much advanced, if so, what was the market price at the time they put it in?

394 A. I don't know, sir, at that particular time, except that in '98, after I went in the office, I paid some invoices for this pipe and it was at the rate of $17.90 per ton.

Q. Now what was it worth in 1900?

A. I beg pardon: was that the year the bridge washed away?

Q. At the time the Rose Hill stand pipe was erected?

A. I don't know, I don't recollect.

Q. What is it worth now?

A. The last quotation we had possibly three weeks ago, was $33. per ton.

Q. In this statement I notice you refer to discount on certain bonds: It is not necessary to enumerate these: They appear at various rates of discount: Now how were those bonds charged?

A. I don't know hardly how to get at it except the expenditure had to be made for betterments before the bonds were delivered to the company on the statement gotten up by the secretary and treasurer of the company. When the bonds were obtained or delivered to them by the Mercantile Trust & Deposit Co., they were sold and sold at their market price after they were delivered to the water works company.

Q. And sold?

A. Yes, sir; sold afterwards.

Q. That discount is the discount at which they were sold. Now the difference between the discount and the par value of the bonds, who was that paid by?

A. It was paid by the water works company in the original improvement.

Q. The improvement before they obtained the bonds from the Mercantile Trust & Deposit Co.; so that the bonds which ap-
395 pear in this statement, the discount that appears in this statement, was paid by the company?

A. Well, yes, in this way——

Q. I want to ask you if this amount which you have in here charged as discount on bonds: You are familiar with the account?

A. Several of them, yes.

Q. Whether that amount will aggregate the amount—will amount to as much as the profit, on the various items of expenditure mentioned in this list, pipes, etc.?

A. I could not tell; but I think those several amounts there is $6700.

Q. They amount to that much?

A. Yes, those several items charged into the property account, they call it, on the books, is $6700. Then in the case of pipe, now if that's what you mean, the difference in the cost of pipe, what the company paid for the pipe that went into the Rose Hill extension, would be $7500, about.

Q. How about the price of labor in these various amounts of work?

Mr. MARTIN: We object to that. That was gone over in the direct examination. Showed the price of labor to be 75 cents per day.

Objection overruled.

Q. How does it compare with the price of labor now?

A. That pipe was laid by common labor at 75 cents per day. Ninety cents a day, I believe is what they have been paying lately a day.

Objected to as irrelevant and immaterial.

Objection overruled.

396 Q. How does the general price of this other material, hydrants, etc., mentioned in this list, compare with the present prices?

A. Much higher now than then.

Q. You recall the standpipe on Rose Hill: Can you point to the place where the standpipe is at in this account?

A. Yes, sir: $5700., is my recollection. Rose Hill stand pipe, in '97, $5794.26.

Q. You know how many thousand brick included in that?

A. No, sir.

Q. That's the whole cost?

A. That's all charged to that account.

Q. What could that standpipe be built for at the present time?

A. I don't know.

Q. Well, generally, according to the increase in brick and iron?

A. I think it would cost $8000.

Q. Not less than that?

A. No, sir.

Cross-examination.

(By Mr. MARTIN:)

Q. You were asked to get up a statement of the items that constitute this $95000?

A. Yes, sir.

Q. How did you get up those items?

A. I got it from the voucher record, where these several items are charged. From the vouchers that make up the betterments?

Q. Did you put on the extra prices, what it would cost to get it to-day?

A. No, sir; copied it exactly from the voucher record, as to what was paid by the company.

Q. Now you stated awhile ago that you could not get all
397 the invoices: Where are those that you could get?

A. In the office in the files where the vouchers are filed.

Q. Why didn't you get them: You were asked to bring them?

A. I can send for them. They are in 14 letter files or boxes.

Q. Did you refer to them in making up this statement?

A. Yes, sir. As to this pipe $17.90, I looked back in '98 to see what they paid for pipe in '98.

Q. You say you bought 30,000 feet of pipe?

A. Yes, sir.

Q. At $17.90?

A. I would not say that positively, because I don't know that the whole of it was bought at $17.90.

Q. Didn't you state that in your affidavit that you made?

A. It may. I would not say it now positively.

Q. Deponent says that 30,000 feet of pipe was purchased for cash at the lowest cash prices: You stated that in your affidavit?

A. Yes, sir; since I made that statement, could not find it beforehand, I have looked closely for it, I learn that some of that pipe was bought for $15.65. That was gotten up really from a book in the office of Mr. Preer, the superintendent, and what my father and I recollect about it.

Q. I see you have got charged in here, about the first item, new service pipe at cemetery?

A. New service pipe and connections.

Q. What items were those?

A. What are they?

Q. Yes?

A. They are for pipe laid from the main up to the outer edge of the sidewalk, from a tap in the main; and what they call
398 a stop-valve in the main, and valve at the sidewalk and the labor expended in this service.

Q. I see you have charged new meters and meter boxes, $3262.41: what are they for?

A. Meters and meter boxes. Some of them are bricked up.

Q. How many meters were there?

A. I don't know, sir. That far back I don't know.

Q. I see you have got here $1465., purchase of the Stewart Spring property?

A. That's what they paid for it.

Q. You never improved that?

A. No, sir.

Q. Never used it?

A. No, sir.

Q. Then has it gone into the betterments of the system?

A. Lands—the property is on hand. Paid the money for it.

Q. New hydrants $651.65: what are they for?

A. Hydrants placed on the mains. Ordered by the city and we furnished them.

Q. Those on new mains or to replace others?

A. No, sir; means new hydrants being put in different places.

Q. If one gives out you charge that on this account?

A. It goes to repairs. There is an account on the books for repairs to hydrants.

Q. Discount on $15,000. of bonds at 7½; and six thousand and

one thousand and two thousand, some 20 and some 7½: Why did you charge that on this account for betterments?

399 A. Because Mr. Beasely, the former book-keeper, did that.

Q. Commencing with 1891?

A. '91 or '92: whenever the first item was.

Q. You charged as betterments discount on bonds?

A. I did not. Mr. Beasely did.

Q. You followed it up afterwards?

A. Yes, I thought he was right about it.

Q. You charged up the bonds, didn't you?

A. Yes, got a first mortgage bond account on the ledger.

Q. You charged them up to betterments—you charged up what you put on the statement: You charged up every item you put on the statement?

A. Yes, sir.

Q. You then charged up the discount on the bonds too?

A. Yes, sir; appears that way to me.

Q. You don't know whether these things are correct or not, what you find on your books?

A. Yes, sir; I can from '98 up.

Q. I am talking about prior to that time?

A. No, sir.

Q. The items were not given?

A. Yes, sir.

Q. You don't state them that way here?

A. They are all entered by these vouchers. Entered in the voucher book. Take about 6 months to get it all up.

Q. I see you have got a sand-trap, upper reservoir?

A. Yes, that was put up at the upper end of the reservoir. That was before I went there.

Q. Discontinued using that?

A. No, sir; it is still there; but filled up with sand.

Q. You say that was charged up to improvement on the reservoir?

A. Yes, sir.

400 Q. Land purchased from McElvey: you have never used that, have you?

A. The land is there. Never have used it yet; but bought it for that purpose.

Q. That is a betterment to the system?

A. Yes, sir.

Q. I see you have got the Stewart Spring property down below there again?

A. Yes, sir; charged in there but I don't know exactly what that was.

Q. I see you have got engineering, surveys, maps, etc. charged in here?

A. He always claimed——

Q. (Interrupting.) That's a betterment.

A. Yes, claimed that as a betterment.

Q. Yet you never used any of his work—didn't use his work: I mean to say you didn't carry out any improvement?

A. Didn't think they have been necessary: seems they have not.

Q. Still you call that a betterment?

A. Yes, sir.

Q. I see you have got charged in here: improvement to reservoir: What sort of improvement to reservoir is that?

A. I don't recollect. I don't think there has been any improvement charged to the reservoir since I have been there. I don't know what that was.

Q. This was in '95?

The MASTER: He says he knows nothing prior to '98: what date in '98?

WITNESS: October 15, I went in office. I copied it as I found it there from the ledger.

Q. $5000 more bonds at 15 per cent., $750. That was in '96: You were not there then?

A. No, sir.

401 Q. Improving the reservoir again: that's '96: I suppose you know nothing about the Rose Hill standpipe: New valve boxes, what were they for?

A. That means boxes built around the valves so as to get at them to open and close them.

Q. Some engineering, surveys, maps, etc. again. Improvement to reservoir again. Now the Rose Hill Standpipe—That's '97: You don't know anything about that?

A. No, sir.

Q. You found on the books this amount charged out?

A. Yes, sir.

Q. You keep an account of that kind: What kind of an account do you call it?

A. Betterment—I mean property account on the ledger.

Q. You keep yours as a property account?

A. Yes, sir.

Q. These items put on here for valves, meter boxes, and everything of that kind?

A. Yes, sir.

Q. Whenever anything breaks down and you have to replace it, you charge that on here?

A. No, sir.

Q. Don't charge them on here?

A. No, sir; have certain accounts for each repairs, that is, to service pipes, repairs to meters and meter boxes, charged out that way.

Q. When you replace pipe where do you put it?

A. Repairs to service pipe, if it is a small one.

Q. Suppose it is a large one?

A. Never had any, except may- to crack, something of that kind, have one to break and cut out 5 or 6 feet. There is an account on the books for repairs to mains that those things are charged to.

402 Counsel for complainant stated that they had introduced all the testimony they had at hand just at this time; and closed, reserving the right to introduce such other witnesses as might be accessible later on during the hearing.

A. I suppose it is the mechanical method. I am familiar with the system as it is installed in Atlanta.

Q. As I understand it, the system here is a sand bed?

A. Is a sand-bed?

Q. And they may use alum also?

A. Use both?

Q. Use both alum and the sand: Would you call that a combination system?

A. Combination?

Q. Yes?

A. I should say it would be a combination system.

Q. Would either system remove germs of typhoid fever?

A. O, if it removed any sort of germ it would remove them. I should say if it removed any ordinary germ it would remove the germ of typhoid fever.

Q. Can you say to what extent it is efficacious in the removal of disease germs?

A. No, sir; I can't say. All microbes are practically about the same size. They are very minute and can only be seen under high power of the microscope. If one is removed, whether it be harmless or harmful, it is fair to presume that all would be removed.

Q. How long has this method of filtration been in practical use?

A. Well, I have known of the mechanical method being in use for the last 15 or 20 years. I have known of it that long of my own personal experience. I don't know just how much longer
374 than that—I think about 25 or 30 years it has been in use.

Q. What do you mean by the chemical method?

A. The method of precipitation by means of alum or sulphate of iron. You take water like the Chattahoochee River water, like we have it in Atlanta, it is turbid. The mud is suspended matter and when they filter it, they run a small stream of alum into it; and when the alum mixes with the water, a chemical reaction takes place between the sulphate of alumina and the carbonate of lime or magnesia contained in the water.

Q. Do I understand you to say that that method is practically as good as the other method?

A. Yes, I think it is.

Q. Suppose you have a water system, the capacity of the reservoir from which the water is drawn for use does not exceed 13,000,000 gallons, where the daily consumption will not exceed a million gallons, would it be practicable to use the chemical method of filtration?

A. In a system of that size I should say so.

Q. What effect would the running of pure water through impure pipes, that is, pipes in which there may be sediment impurities, have upon the water?

A. Well, of course if there were impurities in the pipes, the water would be contaminated by those impurities after it had been filtered.

Q. It being very difficult to get them clean, I understand from your answer the presence of these impurities in the pipes, apparently, would affect the quality of the water?

A. That is to say, as judged by an analysis. A chemist might condemn water as impure which was perfectly pure. For
375 instance: he makes up his verdict as to the character of the water from the amount of ammonia he finds in it, salt, etc. No harm in ammonia, *per se;* and no harm in salt. Take it in our food, large quantities every day. If a chemist finds much salt in water, it is an indication that sewerage matter may have had access to the water. If he finds much ammonia in the water, it is a clew that indicates that there is matter from some decomposed animal or vegetable matter, like a dead cat or a dog, has been in the water and the nitrogen in its tissues had been conveyed into the water by putrefaction. No harm in the ammonia itself but simply a clew.

Q. What impurity did you find — the water analyzed by you sent you by Dr. Bullard that caused you to condemn that water?

A. The principal thing that caused me to condemn that water was that it was not clear and bright. It was cloudy; and I judged from the fact that I had received at the same time a sample of water from Mayor Chappell, that I was analyzing water before it had been filtered and one after it had been filtered. The one from Mayor Chappell was very dirty and cloudy and muddy and the other, whilst it was a very much superior article to the one received from Mayor Chappell, still was not bright and clear. Also the figures for albuminoid ammonia in the water received from Dr. Bullard were higher than I was accustomed to find in water that I knew was filtered in Atlanta by the alum process; and therefore, I
376 judged that the filtration was imperfect. Either that or the water had been contaminated, without Dr. Bullard's knowledge, from his putting it into a jug which he could not see was clean.

Q. The presence of this ammonia in that sample of water, did that indicate that it might have come in contact with sewerage?

A. No, sir; there was not enough in it to indicate that. We also take into consideration other facts. For instance the amount of chlorine in the water, which indicated that the common salt was exceedingly low, which led me to believe or conclude that what ammonia was in the water did not come from sewerage matter. In point of fact, if you will read the remarks I made about that water, you will see I did not condemn that water. I simply said I can not recommend it simply on the side of conservatism. The figures I obtained would not justify me in condemning that water.

Q. If water, when drained into a receptacle or a bath-tub or a pitcher, and left standing over night, would deposit sediment after the water had been filtered, what would that indicate?

A. Well, it would indicate incomplete filtration.

Q. If the water before filtration was impure and the filtration incomplete, then the water, after it had been filtered, to that extent would be impure?

A. Yes, sir.

Q. Suppose that water left standing over night gave off an unpleasant odor, what would that indicate?

A. It would indicate probably it had been in contact with
377 some substance that generated such an odor.

Q. Does water, when running through pipes of a system if the water itself be impure, muddy, full of organic matter, deposit impurities in the pipes?

A. If the water itself be pure?

Q. No, if the water be impure?

A. Yes, I suppose it does. I have never examined any pipes; but I have heard that muddy water will deposit a thick crust on the inside of pipes.

Q. Suppose that you forced pure water through those pipes, would that water become contaminated?

A. Yes, to some extent, I should say. I think if pure water were pumped for a long time through pipes that had muddy crust in them, after awhile all of the impurities which it would be capable of taking up, would be practically removed. Mud, for instance, there is no harm in mud, clay, anything of that kind; but it is the organic substances that might be mixed with it.

Q. Washings from hillsides?

A. Yes, washings from hillsides is composed of mineral matter, clay, soil and small quantities of organic matter, animal microbes—germs that live in animals, which of course are harmful. So far as the clay mixing with the water except from being bad looking, has the least harm about it.

Q. Your analysis of the water that Dr. Bullard furnished you, from that analysis did you discover vinegar?

A. I only judged by the stopper.

Q. Would your analysis show vinegar if it were present?

378 A. If vinegar had been in that jug, my figures for albuminoid ammonia would have been higher than they otherwise were; because vinegar does contain a little nitrogen. The method I use in analyzing water frees any nitrogeneous matter that may be in the water, no matter from what source it comes.

Q. Did you find any impurities that came from the condition of the jug: Did your analysis discover any other impurities?

A. No, sir; I did not condemn the water. The water, so far as the analysis goes, some chemists might have passed the water and called it good water.

Q. What I am trying to get at is this: I want to see if your analysis discovered anywhere any impurity that you could trace to the jug itself?

A. No, no.

Q. And if your opinion is simply dependent upon the odor which you thought you detected in the stopper?

A. My opinion was dependent upon the odor which I thought I detected from the stopper, from the fact that the water came in a jug; because no one can tell when a jug is clean. He can't see. It is not transparent and he can't tell.

Q. So it is an inference on your part that the jug might have been dirty?

A. Might have been.

Q. You made that certificate to the analysis you sent Dr. Bullard; why did you decline to make an affidavit to that?

A. Why did I decline to make an affidavit?

Q. Yes?

A. Because the gentleman who called for the affidavit objected to my inserting in it the fact that the water had come in a jug;
379 and that I had written a letter to Dr. Bullard at the same time I mailed him the analysis.

Q. If you deemed that important, why didn't you put that in your certificate?

A. Because really it was an after thought. After I got through writing it out, the reason I didn't keep a copy of it really is this: I have no stenographer and being very busy in the lab-atory most of the time, when I make an analysis of this kind, I have got a typewriter in the office, I sit down and write it off myself on the typewriter and take a carbon copy; but I am no expert on the typewriter and I really prefer to write with a pen. I wrote off the analysis so I might have a copy to keep myself. But before sending it off thinks I, I better write a letter to Dr. Bullard and call his attention to the jug, there may be trouble about this water; is about the fact of it. I sat down and wrote him a letter with a pen and I have no idea that I kept a copy of it. I don't keep copies, as a rule, unless I think there is going to be some trouble.

Q. Doctor, assuming that the sample of water submitted to you by Mayor Chappell and analyzed by you under date of August 17 was taken from the lower reservoir before filtration; and further assuming that the sample furnished you by Dr. Bullard and analyzed under the same date was taken from the city mains after filtration, the filtration being by the combined chemical and mechanical process, explain why the free ammonia in the unfiltered water
380 should be only 0.07 parts per million, and after filtration it was 0.300?

A. You have just got it reversed. Before filtration it was 0.300. The sample received from Mayor Chappell was the unfiltered water.

Q. The filtration had reduced it?

A. Filtration had enormously reduced it.

Q. From 0.300?

A. To 0.07.

Q. And albuminoid ammonia from 0.23?

A. To 0.082.

Q. That due to filtration?

A. Yes, sir.

Q. Do you call that an abnormally large amount of free—albuminoid ammonia?

A. No, sir; it is not; and if that water had been clear and brilliant, I would have passed it as good water. As it was, I did not condemn it. I simply said I could not recommend it.

Q. The total solids before filtration were 56.00?

A. Yes, sir.

Q. And after filtration 46.00?

A. Forty six.

Q. Does that indicate complete filtration?

A. Well, total solids, I would like to explain, consists of two kinds of substances, suspended matters and dissolved matters. The suspended matter is the mud or any other dirt that may be in the water. Dissolved matter consists of carbonates of lime, magnesia, sodium chloride and anything like that. The water can be perfectly clear and yet contain large quantities of matters in solution. That water with 46.00 total solids, means matters in solution.

Q. Could not perfect filtration reduce those solids very much—I mean practically perfect?

381 A. It will reduce it very considerably, yes.

Q. Should it not reduce it more than was done in this case?

A. Well, I should think not; because that is a small amount. 46.00 parts per million, as you will see is 2.6826 grains per gallon. The average spring water throughout the country will contain from two *to* five grains, although it be as brilliant as a crystal.

Q. This water before filtration contained only 3.2658 grains per gallon?

A. Yes.

Q. Why is it that spring water ordinarily would contain more solids than it seems this unfiltered water does?

A. Spring water is in the ground and it comes more thoroughly in contact with the minerals in the soil and meets up with more magnesia and other dissolved matters than water in a reservoir that comes merely from the surface. Reservoir water does not dissolve as much mineral matter as spring water.

Q. I notice the volatile and organic matter before filtration is 16.90?

A. A. Before filtration 16.90 and after filtration 16.00. It is reduced. Of course the amount of volatile and organic matter is small as compared with the other.

Q. Then the practical effect of filtration in this case has been to reduce the solids from 56. to 46?

A. Yes.

Q. And to reduce the free and albuminoid ammonia?

A. Yes, it has reduced them.

Q. It has had *not* substantial effect on the volatile and organic matter?

A. Comparatively little.

382 Q. Very little on chlorine, hasn't it?

A. Would not be expected to have on chlorine. Chlorine is entirely soluble.

Q. What was taken out of this water by filtration? How much did that improve the water?

A. It improved it enormously. You will notice the things which have been largely reduced are the things which indicate organic impurity. For instance: 0.300 parts per million before it was filtered, has been reduced to 0.07. That shows that a large quantity of organic matter was removed from the water; and in the same way with reference to albuminoid ammonia. There is very little or none

of the chlorine removed from the water; and would not expect filtration to remove much of it. For instance: you can dissolve a pound of sugar in a gallon of water and filter it thoroughly and you will have your pound of sugar in the water just the same after filtration. The filter is not going to hold anything that is in solution.

Q. Does not remove anything in solution?

A. Does not remove anything that is in solution or that is capable of being dissolved. Salt is one of the things that would be dissolved and sugar would be dissolved. Ammonia is absorbed in the sand or charcoal; and things that produce the ammonia are removed, any decayed or vegetable matter, for instance, like a dead rat or a dead cat, anything of that kind would be taken out. Consequently, water after filtration would not show that.

Q. Now under what head would that kind of organic mat-
383 ter be that you speak of?

A. Nitrogen as nitrates, they refer to——

Q. I don't mean that: I say under what head—Now suppose there was animal matter or injurious animal or organic matter in the water, where would you place that?

A. Place that very likely under the head of albuminoid ammonia, nitrogen as nitrates and nitrogen as nitrites. They would all refer to organic matter in the water. If I were to make a complete analysis of water, I would test for carbonate of lime, carbonate of sodium and other minerals.

Q. What do you include in volatile and organic matter?

A. Volatile and organic matter would include any vegetable or animal matter.

Q. Doctor, I don't think you have answered my question: I want to know what is included in volatile and organic matter?

A. It is what goes off when the total solid matter in the water is heated, all the organic matter, vegetable or animal.

Q. Then this analysis showed that very little of that was removed by filtration in this case?

A. Sixteen as against sixteen and ninety one hundredths. That is something about which a chemist pays very little attention in making up his verdict on the character of the water. Sometimes it is put in. I happened to put it in because I wanted to see whether the stuff turned black when I heated it. You can tell by weighing the dish before and after what volatile matter has gone
off. While it is boiling, before it gets down to dryness, a
384 great deal of that ammonia goes off in the steam and consequently you have not weighed that; and I would reach the same conclusion about that analysis without having the volatile and organic matter. In a great many cases I don't put it in.

Q. You base it upon the free and albuminoid ammonia?

A. Free and albuminoid ammonia and the chlorine. If the chlorine were to run up high, say 6 or 7 grains, that would change my whole opinion about the water.

Redirect examination.

(By Mr. WIMBERLY:)

Q. Doctor, they have asked you about what an odor in the water would indicate: Was there any odor in this water that you examined the sample of?

A. I could not smell any, no, sir. I could smell a little odor of vinegar, as I stated, on the stopper. That's the only odor I detected.

Q. If the staying over night would cause an odor, it would have had time for the odor to have manifested itself after it had been taken out of the system here before you had an opportunity to examine it: How long did you examine it—before you examined it after it was taken out of the system here?

A. Well, I don't know exactly. I suppose 2 or 3 days elapsed between the time it was taken here and the time I commenced my analysis of the sample.

Q. Do you remember whether you delayed the examination of it: have any recollection about it?

A. I think I went at it as soon as I could find time to do it.

385 Q. Do you remember whether you were requested to do it at once?

A. That's my recollection. That Dr. Bullard wrote me to do it as soon as possible. I think possibly 2 or 3 days, might have been more, between the time the sample was taken and the time I examined it.

Q. Doctor, they asked you about sediment in a bath-tub. Would that depend partly upon the condition of the bather, the condition of the water and the condition of the bather using it?

A. That would be hard to say.

Q. You speak of nitrogen as nitrates in this water as indicating any organic impurities that are regarded as deleterious: I will ask you whether the nitrogen as nitrates indicated the presence of such matter in any dangerous quantities?

A. No, sir; mere traces.

Q. I believe you say in arriving at the probable presence of deleterious matter, do you go by one of these traces or——

A. (Interrupting.) By the whole thing taken together.

Q. The proportion that one bears to the other aid you in determining that?

A. Yes. More stress is laid on the presence of nitrogen in any form than anything else. A large quantity of free and albuminoid ammonia indicates a very considerable quantity of organic matter.

Q. Was there any large quantities of nitrogen in either of these samples?

A. Only the first one sent by Mayor Chappell, the unfiltered water. The nitrogen was high and would condemn any water without going any further, that showed as large quantity of free and albuminoid ammonia as that water did?

Q. How was it as to the other sample?

A. Well, it was very much less.

386 Q. Those were per million parts, was it?

A. Yes, sir.

Q. Free ammonia showed 0.07 of one part in a million parts?
A. Seven pounds in a million pounds to express it definitely.
Q. Seven pounds in a million pounds?
A. Yes, sir.

Q. Nitrogen as nitrates and nitrogen as nitrites, traces: What do you mean by traces? What per cent. would that be?

A. You simply could not express it. The method of tracing for nitrogen as nitrates is the clearing method. You see mere traces by clearing corresponding to the presence of nitrogen as nitrates and as nitrites.

Q. On the matter of filtration in vogue: do you know how long the present mechanical method has been in use—mechanical filtration?

A. There are several of those methods; and I think they have been in practical, effective use for something like 25 or 30 years probably.

Q. From your experience are you able to say whether there has been considerable improvement in them in the last few years?
A. Well, sir; I don't know. I have not kept up with that.

Recross-examination.

(By Mr. WIMBISH:)

Q. I will let Dr. McCandless examine these analyses and identify them that I examined him on so that we can introduce them?
A. Yes, sir; that is the original analysis that I sent.
Q. And correctly sets forth the analysis as made by you?
387 A. Yes, sir.

Q. This one is dated August 17, 1903, sample of water received from L. H. Chappell, said to be from the lower reservoir, unfiltered?
A. Yes, sir.

The MASTER: That was subse-nt to the filing of this bill?
Mr. WIMBISH: Yes, sir.

Q. August 17, 1903, sample of water furnished by Dr. W. L. Bullard?
A. Yes, sir.
Q. That correctly sets forth the analysis you made?
A. Yes, sir.
The MASTER: The analysis you made for the water company was made in September, 1903?
A. Yes, sir; September 3rd it was dated.

388 T. N. KITCHEN, sworn by the complainant, testified as follows:

(By Mr. WIMBERLY:) We have no questions for him, except we have put in his affidavit.
Q. That correctly sets out the fact, doesn't it doctor?
A. Yes, sir; that's it. (Referring to affidavit.)

Cross-examination.

(By Mr. MILLER:)

Q. Did you get this water at the filter plant?
A. Yes, sir.
Q. From the clear water basin?
A. Yes, sir.
Q. After it had been filtered?
A. Yes, sir.
Q. You sealed it up and sent it to Mr. McCandless, the State Chemist?
A. Yes, I sealed it and came with the jug to the express office and turned it over to the Express Agent and had him to re-seal it also, the express agent.
Q. You sent that in a jug?
A. In a demijohn—glass demijohn.
Q. Did it have anything on the outside of it?
A. No, sir; I think it was perfectly transparent.
Q. See through it?
A. Yes, sir.
Q. How long have you been in Columbus?
A. Twelve years.
Q. What is the quality of water we have had in Columbus since you have been here?
A. It has been all qualities.
Q. Before the establishment of this filter plant by the Columbus Water Works Company?
A. Well, before that the quality at times was unfit for drinking purposes on account of the matters in suspension.
389 Q. Do you remember the times it was in that condition?
A. Yes, during the summer of 1902.
Q. What was the condition of the water at that time?
A. Well, it was full of mud and was unpalatable.
Q. Was it fit for domestic use?
A. No, sir; could not say it was for cooking purposes nor for bathing purposes even.
Q. How many months was the water unfit for domestic use?
A. I don't know, sir, 2 or 3 or 4—I don't know, did not keep any record of it.
Q. Do you remember any time previous to 1902 that it was unfit for use?
A. Frequently for a day at a time after heavy rains the water would be muddy.
Q. How about the Fall of '95 and '98 and 1901, wasn't there considerable periods of time in the Fall of those years that the water that we got from the Water Works reservoir was very unwholesome?
A. Well, it was unpalatable at times but I could not say it was unwholesome, because I drank it myself most of the time. Had to in self defense.
Q. You drank it without filtration?
A. Yes, sir.

Q. Had ice in it?
A. Yes, lowered the temperature of it.
Q. Did it have an odor?
A. Yes, frequently had an odor.
Q. What was its condition as to clearness?
A. At times it was real muddy and at times practically clear.
Q. Isn't it a fact that in most every dry season—Fall season, the water at that time became very foul and offensive to the smell?
A. Yes, sir.
Q. Did you regard it as fit water for domestic use at those times?
A. No, sir.

390 (By Mr. WIMBERLY:)

Q. Since the date of that analysis how has the water been?
A. All right.

391 E. H. EPPING, re-called by the complainant, testified as follows:

(By Mr. WIMBERLY:)

Q. This statement that you made up of the amounts expended for betterments to the plant of the Columbus Water Works Company, for the years 1891 to the first of July, 1902, inclusive, requested by defendants' counsel, that you now hold in your hand, is that a correct statement?
A. Yes, sir; taken from the books of the company.
Q. Mr. Epping, your statement, from the hurried examination I have been able to make of it, does not state the price of the pipe: Do you know what was paid for the pipe?
A. The best I could find out, sir—some of the invoices are missing. They are not there.
Q. Can you name the amount that would cover it?
A. Not for all of it, no, sir.
Q. What proportion of it can you?
A. Lots of it laid before I went in the office. I went there in '98. That is placed back to '91. This is a copy of the books from '91.
Q. Can you name an amount that is sufficiently large to cover the cost of the different pipe, that is, the dates, when it was bought, and the price?
A. No, sir; I could not.
Q. During what part of the time can you?
A. I went in the office in October, 1898. There are the invoices there pinned to the vouchers.
Q. As far as you have invoices what was it?
A. The prices varied from $17.90. I think it was, up to as high as $33 a ton.
392 Q. What is the present price?
A. Thirty three dollars I think is the lowest quotation we had delivered here.
Q. Thirty thousand feet, was there—was that about the quantity, I believe?

A. I think so, yes.
Q. What was the cost of that?
A. The invoices I have seen show $17.90 a ton.

The MASTER:

Q. How many tons in 30,000 feet?
A. About 500 of six inch pipe: about 60 feet to the ton. Runs about 400 pounds to a length of 12 feet. It comes in 12 foot lengths.
Q. Every 12 feet weighs 400 pounds, about that?
A. Yes, sir; about that. It will run about 60 feet to the ton.
Q. 60 feet to the ton, 30,000 feet: that would be 500 tons?
A. Yes, sir.

(By Mr. GARRARD:)

Q. This 30,000 feet of pipe that you speak *you*, do you refer to the pipe pile near the engine house, do you not?
A. That's some of the pipe.
Q. How long had that pipe been there before it was laid on Rose Hill and in the lower part of the city?
A. I don't know, sir.
Q. Wasn't it a considerable length of time?
A. I think it was. When I went to the office—I don't know.

Objected to as leading.

Q. That's the pipe you refer to as being on hand?
A. Yes, sir.
393 Q. Where was that pipe finally used?
A. That particular pipe?
Q. Yes?
A. I don't know, sir.
Q. Wasn't it used in the betterment and extension of this system?

Objected to as leading.

WITNESS: I could say it was used but I don't know the particular street it was laid on.

Q. I mean was it——

Objected to the form of the question.

The MASTER: Put your question in legal form.

Q. What would that same pipe be worth now?

Objected to as being irrelevant. Objection overruled.

Q. Was that pipe charged in at any greater value than $17.?
A. No, sir; it was not.
Q. Now at the time that pipe was used, do you recall the value of the pipe at the time it went in the ground?
A. Yes, sir; 1898 is when we paid $17.90 for pipe. The invoice I saw there was in '98.
Q. What did it get to be worth very soon after that?
A. As high as $33. a ton.

Objected to on the ground that witness does not state the date.

Mr. GARRARD: I am trying to get at the date.

The MASTER: You can ask him this question: At the time the company put this pipe into the ground, had not the price of pipe very much advanced, if so, what was the market price at the time they put it in?

394 A. I don't know, sir, at that particular time, except that in '98, after I went in the office, I paid some invoices for this pipe and it was at the rate of $17.90 per ton.

Q. Now what was it worth in 1900?

A. I beg pardon: was that the year the bridge washed away?

Q. At the time the Rose Hill stand pipe was erected?

A. I don't know, I don't recollect.

Q. What is it worth now?

A. The last quotation we had possibly three weeks ago, was $33. per ton.

Q. In this statement I notice you refer to discount on certain bonds:-It is not necessary to enumerate these: They appear at various rates of discount: Now how were those bonds charged?

A. I don't know hardly how to get at it except the expenditure had to be made for betterments before the bonds were delivered to the company on the statement gotten up by the secretary and treasurer of the company. When the bonds were obtained or delivered to them by the Mercantile Trust & Deposit Co., they were sold and sold at their market price after they were delivered to the water works company.

Q. And sold?

A. Yes, sir; sold afterwards.

Q. That discount is the discount at which they were sold. Now the difference between the discount and the par value of the bonds, who was that paid by?

A. It was paid by the water works company in the original improvement.

Q. The improvement before they obtained the bonds from the Mercantile Trust & Deposit Co.; so that the bonds which ap-
395 pear in this statement, the discount that appears in this statement, was paid by the company?

A. Well, yes, in this way——

Q. I want to ask you if this amount which you have in here charged as discount on bonds: You are familiar with the account?

A. Several of them, yes.

Q. Whether that amount will aggregate the amount—will amount to as much as the profit, on the various items of expenditure mentioned in this list, pipes, etc.?

A. I could not tell; but I think those several amounts there is $6700.

Q. They amount to that much?

A. Yes, those several items charged into the property account, they call it, on the books, is $6700. Then in the case of pipe, now if that's what you mean, the difference in the cost of pipe, what the company paid for the pipe that went into the Rose Hill extension, would be $7500, about.

Q. How about the price of labor in these various amounts of work?

Mr. MARTIN: We object to that. That was gone over in the direct examination. Showed the price of labor to be 75 cents per day.

Objection overruled.

Q. How does it compare with the price of labor now?

A. That pipe was laid by common labor at 75 cents per day. Ninety cents a day, I believe is what they have been paying lately a day.

Objected to as irrelevant and immaterial.

Objection overruled.

396 Q. How does the general price of this other material, hydrants, etc., mentioned in this list, compare with the present prices?

A. Much higher now than then.

Q. You recall the standpipe on Rose Hill: Can you point to the place where the standpipe is at in this account?

A. Yes, sir: $5700., is my recollection. Rose Hill stand pipe, in '97, $5794.26.

Q. You know how many thousand brick included in that?

A. No, sir.

Q. That's the whole cost?

A. That's all charged to that account.

Q. What could that standpipe be built for at the present time?

A. I don't know.

Q. Well, generally, according to the increase in brick and iron?

A. I think it would cost $8000.

Q. Not less than that?

A. No, sir.

Cross-examination.

(By Mr. MARTIN:)

Q. You were asked to get up a statement of the items that constitute this $95000?

A. Yes, sir.

Q. How did you get up those items?

A. I got it from the voucher record, where these several items are charged. From the vouchers that make up the betterments?

Q. Did you put on the extra prices, what it would cost to get it to-day?

A. No, sir; copied it exactly from the voucher record, as to what was paid by the company.

Q. Now you stated awhile ago that you could not get all
397 the invoices: Where are those that you could get?

A. In the office in the files where the vouchers are filed.

Q. Why didn't you get them: You were asked to bring them?

A. I can send for them. They are in 14 letter files or boxes.

Q. Did you refer to them in making up this statement?
A. Yes, sir. As to this pipe $17.90, I looked back in '98 to what they paid for pipe in '98.
Q. You say you bought 30,000 feet of pipe?
A. Yes, sir.
Q. At $17.90?
A. I would not say that positively, because I don't know that whole of it was bought at $17.90.
Q. Didn't you state that in your affidavit that you made?
A. It may. I would not say it now positively.
Q. Deponent says that 30,000 feet of pipe was purchased for at the lowest cash prices: You stated that in your affidavit?
A. Yes, sir; since I made that statement, could not find it forehand, I have looked closely for it, I learn that some of that was bought for $15.65. That was gotten up really from a book the office of Mr. Preer, the superintendent, and what my father I recollect about it.
Q. I see you have got charged in here, about the first item, service pipe at cemetery?
A. New service pipe and connections.
Q. What items were those?
A. What are they?
Q. Yes?
A. They are for pipe laid from the main up to the outer of the sidewalk, from a tap in the main; and what they
398 a stop-valve in the main, and valve at the sidewalk and labor expended in this service.
Q. I see you have charged new meters and meter boxes, $3262 what are they for?
A. Meters and meter boxes. Some of them are bricked up.
Q. How many meters were there?
A. I don't know, sir. That far back I don't know.
Q. I see you have got here $1465., purchase of the Stewart Sp property?
A. That's what they paid for it.
Q. You never improved that?
A. No, sir.
Q. Never used it?
A. No, sir.
Q. Then has it gone into the betterments of the system?
A. Lands—the property is on hand. Paid the money for it.
Q. New hydrants $651.65: what are they for?
A. Hydrants placed on the mains. Ordered by the city and furnished them.
Q. Those on new mains or to replace others?
A. No, sir; means new hydrants being put in different places
Q. If one gives out you charge that on this account?
A. It goes to repairs. There is an account on the books fo pairs to hydrants.
Q. Discount on $15,000. of bonds at 7½: and six thousand

one thousand and two thousand, some 20 and some 7½: Why did you charge that on this account for betterments?

399 A. Because Mr. Beasely, the former book-keeper, did that.

Q. Commencing with 1891?

A. '91 or '92: whenever the first item was.

Q. You charged as betterments discount on bonds?

A. I did not. Mr. Beasely did.

Q. You followed it up afterwards?

A. Yes, I thought he was right about it.

Q. You charged up the bonds, didn't you?

A. Yes, got a first mortgage bond account on the ledger.

Q. You charged them up to betterments—you charged up what you put on the statement: You charged up every item you put on the statement?

A. Yes, sir.

Q. You then charged up the discount on the bonds too?

A. Yes, sir; appears that way to me.

Q. You don't know whether these things are correct or not, what you find on your books?

A. Yes, sir; I can from '98 up.

Q. I am talking about prior to that time?

A. No, sir.

Q. The items were not given?

A. Yes, sir.

Q. You don't state them that way here?

A. They are all entered by these vouchers. Entered in the voucher book. Take about 6 months to get it all up.

Q. I see you have got a sand-trap, upper reservoir?

A. Yes, that was put up at the upper end of the reservoir. That was before I went there.

Q. Discontinued using that?

A. No, sir; it is still there; but filled up with sand.

Q. You say that was charged up to improvement on the reservoir?

A. Yes, sir.

400 Q. Land purchased from McElvey: you have never used that, have you?

A. The land is there. Never have used it yet; but bought it for that purpose.

Q. That is a betterment to the system?

A. Yes, sir.

Q. I see you have got the Stewart Spring property down below there again?

A. Yes, sir; charged in there but I don't know exactly what that was.

Q. I see you have got engineering, surveys, maps, etc. charged in here?

A. He always claimed——

Q. (Interrupting.) That's a betterment.

A. Yes, claimed that as a betterment.

Q. Yet you never used any of his work—didn't use his work: I mean to say you didn't carry out any improvement?

A. Didn't think they have been necessary: seems they have not.

Q. Still you call that a betterment?

A. Yes, sir.

Q. I see you have got charged in here: improvement to reservoir: What sort of improvement to reservoir is that?

A. I don't recollect. I don't think there has been any improvement charged to the reservoir since I have been there. I don't know what that was.

Q. This was in '95?

The MASTER: He says he knows nothing prior to '98: what date in '98?

WITNESS: October 15, I went in office. I copied it as I found it there from the ledger.

Q. $5000 more bonds at 15 per cent., $750. That was in '96: You were not there then?

A. No, sir.

401 Q. Improving the reservoir again: that's '96: I suppose you know nothing about the Rose Hill standpipe: New valve boxes, what were they for?

A. That means boxes built around the valves so as to get at them to open and close them.

Q. Some engineering, surveys, maps, etc. again. Improvement to reservoir again. Now the Rose Hill Standpipe—That's '97: You don't know anything about that?

A. No, sir.

Q. You found on the books this amount charged out?

A. Yes, sir.

Q. You keep an account of that kind: What kind of an account do you call it?

A. Betterment—I mean property account on the ledger.

Q. You keep yours as a property account?

A. Yes, sir.

Q. These items put on here for valves, meter boxes, and everything of that kind?

A. Yes, sir.

Q. Whenever anything breaks down and you have to replace it, you charge that on here?

A. No, sir.

Q. Don't charge them on here?

A. No, sir; have certain accounts for each repairs, that is, to service pipes, repairs to meters and meter boxes, charged out that way.

Q. When you replace pipe where do you put it?

A. Repairs to service pipe, if it is a small one.

Q. Suppose it is a large one?

A. Never had any, except may- to crack, something of that kind, have one to break and cut out 5 or 6 feet. There is an account on the books for repairs to mains that those things are charged to.

402 Counsel for complainant stated that they had introduced all the testimony they had at hand just at this time; and closed, reserving the right to introduce such other witnesses as might be accessible later on during the hearing.

There being no objection on the part of the defense, — complainant closed their testimony, subject to the above.

403 GEO. J. GRIMES, sworn by the respondent- (City of Columbus, *et al.*), testified as follows:

(By Mr. WIMBISH:)

Q. Doctor, what is your profession?
A. I am a physician sir.
Q. How long have you practiced?
A. About 30 years.
Q. How long have you practiced in Columbus?
A. That length of time.
Q. Are you a member of the Board of Health?
A. No, sir.
Q. Have you been in the past a member of the Board of Health?
A. I have been president of the Board of Health two years, sir.
Q. Are you familiar with the quality of water that has been furnished to the city and its inhabitants by the Columbus Water Works Company?
A. Yes, sir.
Q. Won't you please state in your own way what has been the quality of the water, generally, and if bad at times, how frequently?
A. I could not tell you how frequently. It has been very bad at times. Had a very bad odor, particularly at certain seasons; and sometimes very muddy, before they got this filter plant up here.
Q. I mean prior to that time?
A. Yes, sir.
Q. As near as you can approximate it, when did you first observe that the water was bad?
A. I don't remember, sir. Two or three years ago it was very bad.
Q. Was it as far back as '90?
A. One time before that it was bad. I can't give you the dates. I don't remember.

404 Q. Do you re-call the drought of '95?
A. No, sir; I don't remember about that. I don't drink the hydrant water here at all.
Q. Why don't you?
A. I don't think it is the right kind of water to use.
Q. Why not?
A. Well, I don't like to drink out of a sewer. That's the only objection I have to it.
Q. Won't you explain that a little further?
A. I think this river water here—this stream, is a sewer. There is a whole lot of stuff that empties into it along the line from here to Atlanta. The sewerage from Atlanta I know empties into it—at least I have heard that it did: and West Point and probably Bibb City up here.
Q. How about Rose Hill, the surface drainage from there?
A. I don't know where that drains. I don't know, but I suppose it goes into the river.

Q. Could it go anywhere else?

A. I don't know, sir. I have never investigated it.

Q. What effect would the drainage from Atlanta and West Point and the other places you have mentioned, into the river, have upon the water with reference to disease germs?

A. That would depend you know. If there are any diseases that are produced from germs in the bowels, such as typhoid fever, if there was an epidemic as that, and they were to get into the water of course it would contaminate it.

Q. For what distance can these typhoid fever germs be conveyed?

A. I imagine any distance.

405 Q. From your professional observation——

A. (Interrupting.) Most any distance. I don't know—they might sink and be buried in the mud in the river. Might possibly do that; and probably the next big freshet would stir them up again.

Q. From your personal observation and knowledge, do you know of typhoid germs and other disease germs being carried a great distance by water?

A. O, yes, sir.

Q. Do you re-call any specific instance?

A. A number of places here in America and abroad too—I can't locate them right now. I did not expect to be here as a witness, this is my first knowledge of it and I have not refreshed my mind on it. It is current literature.

Q. Carried as much as 120 miles?

A. O, yes, I guess so.

Q. What would be the effect of impure water or unwholesome water upon the system?

A. It would depend.

Q. That is, in the absence of specific germs?

A. That would depend. A man might drink water that would not look very well and it might be all right, so far as disease is concerned.

Q. Not speaking of that. I don't think you caught the import of my question: I want to know what effect the continued use of impure water that did not contain any specific germs would have upon the general condition of the system—general health or as to producing malaria?

A. I don't know what you mean by impure water. What do you mean by that?

Q. I mean water that has a great deal of organic matter in it?

A. It is said to produce malaria. I don't know any other

406 disease it would produce. Fœtal matter—you might call that organic matter—comes from the intestines. I could not tell you unless you put some specific question to me.

Q. Suppose you take water that is loaded with decaying organic matter, say animal matter, such water as would be condemned by chemists?

A. I think it would produce sickness. I could not tell you what kind.

Q. I speak of water that does not contain, so far as known, any specific disease germ, simply water that is loaded with impure matter, organic, animal or vegetable organic matter?

A. Yes.

Q. Prior to 1902—of course I do not expect you to say how often you observed the water being impure, but would you say frequently—every year or two?

A. I could not give you an opinion about it.

Q. Were you a member of the board of health at that time?

A. I was not.

Q. When were you a member of the board of health?

A. I don't remember that.

Q. How was the water in the summer of 1902?

A. I think that's what I have been speaking about. If I recollect correctly 3 or 4 years ago it was very bad—horrible.

Q. At the time of the great drought?

A. Yes. Horrible; horrible—awful. The odor was bad. The water smelled very badly. I hated to bathe in it.

Q. Now how would the health of the community be threatened—to what degree, by the continued use of water in the condition
407 you referred to in 1902?

A. Well, I don't know. I think it would produce sickness. I would suppose so. Not sure about it. The power of resistence of the system is different in different individuals. A man can go in a battle and go through a four years' war, like a lot of our people did, and not get shot; but a battle field is not a very good place for health.

Q. You didn't consider this water very good for health?

A. No, sir.

Q. Do you know where they take the water from the river for their present supply?

A. I do not. I know where their filter plant is. I have been there, just above the railroad track going across the upper bridge.

Q. I understand you don't regard that as wholesome water at that point?

A. It is a question. It is better than water unfiltered. No question about that; but it is not as good as some other waters that might be obtained. Filtering does a great deal to purify water—helps it very much.

Cross-examination.

(By the MASTER:)

Q. Doctor, from your observation as a medical man here in this community for the last thirty years, and your general knowledge of the surroundings of Columbus, what would you say was the best source of water supply for this city?

A. This Blue Spring, I would imagine, Mr. Goetchius. It has been analyzed by a good many people and found to be very pure. On the water shed I don't think there are more than 3 or 4
408 people living on it; and they could be moved off and you would have an absolutely pure watershed.

(By Mr. WIMBERLY:)

Q. There was some investigation, was there not, of the cost of getting Blue Springs water here?

A. Yes, sir.

Q. And on account of the great distance and the necessity of larger pipe to overcome what the hydraulic engineers term friction loss—to overcome it a good long distance, it was found that it would cost about $500,000. to get that water to the city?

A. I don't know; but it would be very cheap at that price.

Q. With the exception of Blue Springs, the different water courses about here are not big enough to supply the city—are there any of them that are free from disease germs, that is Holland Springs over here, where it is properly filtered?

A. Holland Springs?

Q. I mean Holland's Creek—where the present supply is obtained?

A. I suppose so. The more people that live on a water shed the more apt it is to be contaminated.

Q. There are not as many over there as there are on this side of the river?

A. No, sir; I don't think so—not near as many people.

Q. That is a good source of supply?

A. Well, it has proven not to be in the past.

Q. I mean since it is filtered?

A. They filter the water from there and filter the river water but I don't know—it is better than it has been—very much improved.

409 Q. The water as filtered has every appearance or indication of pure, healthy water?

A. It looks like it, yet it might look clear and be poison.

Q. That is true of all river waters?

A. Yes, most river waters where people live along the banks and dump their sewerage into it.

Q. Have you investigated the water situation with reference to the practicability of getting an adequate supply for cities as big as Columbus without going to the river?

A. Put that question again?

Q. Have you investigated the water situation that different cities are confronted with, with a view of determining whether you can get an adequate supply for fire protection, drinking and other purposes without going to the river?

A. You speak of this place?

Q. This place and other places generally?

A. I can't tell you, though I have devoted a good deal of attention to this water business for the last few years. Read up on it and thought about it a good deal.

Q. Is there a big city in the south outside of the artesian belt but what has had to use river water?

A. Let me see about that: I told you I looked into this thing, I didn't look into it for the purpose—I did not expect to be a witness in this case at all and I have not refreshed my mind. I know one

of the North Carolina cities had to leave the river and get their water from some other place.

Q. What city was that?

A. I don't know whether it was Asheville or not—not sure; but I think Asheville was the city.

Q. Asheville is in the Blue Ridge Mountains where of
410 course you can get mountain streams where you could not in other cities?

A. Yes.

Q. With the possible exception of a city right in the Blue Ridge Mountains, is there any city in the south outside of the artesian belt as big as Columbus, but what has had to use river water?

A. I declare I don't remember. My opinion on that would not be of any value. This city can get plenty of good water if they will pay for it.

Q. Get the supply from Blue Springs?

A. Yes, sir.

Q. Are there any water courses big enough to supply the city, going through a country about as thickly settled, to compare with the amount of water that is in the Chattahoochee River?

A. Well, this Blue Spring stream would.

Q. Leave out the Blue Spring and take the others?

A. Not as thickly settled as this?

Q. I mean as thickly settled as compared to the amount of water in the stream?

A. I could not tell you about that.

Q. Well the river gives a much larger stream within itself—a much larger volume of water?

A. Yes, and much more apt to be contaminated by the places it runs by, dumping their sewerage into it. My principal objection to drinking this river water, sir, is, that I do not want to drink out of a sewer.

Q. Whenever you drink river water you feel like you are drinking out of a sewer?

A. Yes, sir; I have that idea; and that's what it is too.

Q. You speak of filtering: you know it to be a fact that the river water is only used to supplement the other source?

A. I think that's the idea.

411 Q. Extraordinary droughts, and things of that sort?

A. Yes, sir.

Q. That would not be the main source of supply of course?

A. No, sir; I don't think so.

Q. How many years did I understand you to say that you were a member of the Board of health?

A. About two years I think, sir. President of the Board two years, I think.

Q. Were you a member of the board any other years?

A. No, sir; I don't think I was.

Q. You could not say what years those were from memory?

A. No, sir. I resigned when the yellow fever made its appear-

ance in Brunswick; and the City Council came to the board and asked for advise. I advised them to quarantine against Brunswick. They would not do it and I handed in the board's resignation, which was accepted.

Q. That was the last time?

A. Yes, sir. They needed a lesson on that line and I think they got it.

Q. They had no special droughts the years you were a member of the board?

A. I don't think my attention was called to it.

Q. The only time your attention was called especially to it was 1902, one time?

A. Yes, about that time; and one time prior to that. That's about all I recollect.

Q. Typhoid germs are really a thing that sometimes get in spring water unless *a* comes through impervious rock strata?

A. It can get in spring water.

Q. Soaks through the ground?

A. Yes, sir.

Q. If the germs are small enough?

A. They are plenty small.

412 Q. It is a matter recognised by the medical fraternity that spring water is frequently as dangerous from typhoid germs as water from streams?

A. Yes, if you empty the germs on the water-shed they are liable to get in the water.

Q. Anywhere on the water-shed where the spring gets its supply?

A. Yes, sir.

Q. Liable to soak through the ground and get into the spring?

A. Yes, sir.

Q. When it comes to typhoid germs it is next to impossible to escape them?

A. No, it is not. If you get a water-shed where the germs are not—the germs come from the bowels—from the stools—foetal matter; and if they get on the water-shed then you get poisoned water.

Q. You have got to get a water-shed where nobody lives?

A. Yes; then it is absolutely sure—then you are sure.

Q. Not many such water-sheds have a supply big enough for a city the size of Columbus?

A. I don't know, sir. You get *get* it up here at this Blue Spring.

Q. Did you ever measure the quantity of water from Blue Springs?

A. No, I have the evidence of men of international reputation who have measured it. I have talked with them on the subject. Talked to three experts who are known all over Great Britain and America.

Q. Do you think there is any other source around Columbus that you yourself favor except Blue Springs?

A. O, I expect you could get it. I think the present source

413 is about as good, unless you were to get it from Pine-Knot Branch. That is a clear branch; but you would have to pump it here then.

Q. When you speak of water being contaminated from typhois germs, it takes a very minute quantity to contaminate water if you have typhoid fever on the water-shed?

A. Well, it depends upon the size of the stream and the amount of typhoid bacillus that is there. If you get them in your mouth, if you are not immune against the disease, you have it. That's the rule.

Q. So that disease germs may exist in colorless water, while mud may discolor the water and may even give it some odor, that is the most serious danger?

A. Well, put that question again please.

Q. Matters in water that are regarded as the most dangerous are they such as may exist in colorless water and not specially those that color the water or even sometimes give an odor to the water?

A. It depends. Some germs are more dangerous than others.

Q. Say typhoid fever germs?

A. Of course they are dangerous if they get into your mouth. If they do not, they are not. They can be in any kind of water.

Q. Can they be in water that is colorless?

A. O, yes.

Q. They don't give any odor to it?

A. No.

Q. The most dangerous disease germs are odorless and colorless?

A. Yes, I expect so, except malarial.

Q. The branch water that we have in this country where it does not go through that part of the country and take on these typhoid germs and other germs that bring on diseases to the human
414 system—Does the discoloration from decayed vegetable matter incur danger?

A. Well, decayed vegetable matter might produce malaria if you drink enough of it.

Q. How about the discoloration from mud?

A. The mud I don't think it would hurt you unless you kept it up.

Q. Mud has got a slight odor to it?

A. It depends upon what is in the mud. The mud itself has very little odor.

Q. Malaria may be conveyed even by such small agencies as musquitoes and things of that sort?

A. That is the popular idea—that's a fact; but I don't believe in it much.

Q. Doctor, do you give your time and attention to the work of an analytical chemist?

A. No, sir. I do a good deal of chemical work; but I don't profess to be an expert chemist.

Q. Did you yourself ever analyze any of these waters?

A. No, sir.

Redirect examination.

(By Mr. WIMBISH:)

Q. Who did you refer to as the men of interbational reputation?
A. Mr. Pierson, Mr. Burbank and Colonel Young.
Q. You mean Mr. George H. Pierson?
A. I don't know what his initials are. New York man.

Recross-examination.

(By Mr. WIMBERLY:)

Q. Who employed Mr. Pierson to come down and make these investigations, the parties interested in the Blue Spring?
A. That's an inference. I don't know, sir.
Q. Who was it that he was down here in the interest of in examining the spring?
415 A. I could not tell you, sir. I suppose the people that are interested in that property up there.
Q. Did he examine any other property except that spring—Isn't it a fact that he was brought down here by the gentlemen interested in that spring?
A. Who do you speak of?
Q. Mr. Pierson?
A. All right.
Q. He was brought here——
A. Yes.
Q. —by the persons interested there?
A. I judge so, I don't know. He made 3 or 4 visits here. He came here in '90 and he condemned this plant over here for some English Syndicate.
Q. Did you see him in '90?
A. No, sir; he told me so.
Q. You get that from what he told you?
A. Yes, sir.
Q. When did he tell you that?
A. Last year on one of his visits here.

Mr. WIMBERLY: We object to that and move to rule it out.
Objection sustained.

Q. How do you know he has an international reputation?
A. I have seen books with his name through it. Built 40 or 50 waterworks plants.
Q. Did he show you those books?
A. I saw them in his room.
Q. You never heard of Mr. Pierson until he came down here at the time these parties sent for him?
A. No, sir.
Q. Who was Mr. Burbank?
A. Mr. Burbank is the man that chained the waters at Saratoga and made electricity out of them.
416 Q. Who brought him or caused him to come down here?
A. I don't know, sir.

Q. He set forth also the claims of the Blue Springs property?
A. I don't know. I could not tell you about that.
Q. Who was the other one you saw?
A. Burbank, Pierson and Col. Young. Son of Brigham Young. He was a Colonel in the United States Army—Colonel of engineers.
Q. What was the purpose of Mr. Young's visit down here?
A. I think it was with reference to that Blue Springs property.
Q. All of them were really employed to come down for that purpose?
A. I judge so. That is an inference.
Q. They were introduced to you by the friends of the Blue Springs property?
A. Yes, sir.
Q. The owners of the property?
A. I don't know about the owners. The people interested in it.
Q. Who were they, doctor?
A. All these gentlemen were introduced to me by Mr. Swift. Every one of them.

417 F. V. SCHLEY, sworn by the defense, testified as follows:

(By Mr. MARTIN:)

Q. What is your profession?
A. Physician.
Q. How long have you been engaged in the practise?
A. About 13 years, I think.
Q. How long have you lived in Columbus?
A. I moved here January 1, 1896.
Q. Have you lived here continuously from that time?
A. Yes, sir.
Q. What have been your opportunities to observe the quality of water that has been furnished to the citizens by the Columbus Water Works Company?
A. Down at my place at the court house, where I stay, that's the water we have. At home we have a good well.
Q. Do you hold any position with the city or county?
A. Yes, sir; I am city physician and *ex-officio* member of the Board of Health.
Q. How long have you held that position?
A. I am now in my 6th year—serving my sixth year.
Q. What has been the quality of water furnished to the city for domestic and drinking purposes since you have lived in Columbus?
A. Well, when we have a hard frost through the Winter, I could drink it—not so bad; but as soon as the weather got warm—as soon as the Summer heat would come on it was just like branch water, not good—I left it alone—made me sick to drink it.
Q. Was that generally every summer?
A. Yes, sir; every summer.
418 Q. State whether or not there was any odor to the water during those times?
A. Several times it has been much worse than others—several

years; but it was always bad; and I didn't use it through the summer.

Q. Would you consider that suitable water for drinking purposes?

A. No, sir.

Q. Did you ever visit the reservoirs of the Columbus Water Works Company?

A. Yes, sir.

Q. How often?

A. I have been there several times fishing during the early Spring months, April and May; and I visited them in 1902 when the water was so bad here. I think there was a howl raised and went over as a member of the Board of Health to see what was the matter; and found very little water there; and it was stinking—terrible, almost turn your stomache to go down to the reservoir.

Q. Describe its condition when you were there?

A. The lower reservoir had dropped several feet below its usual level, could tell by the looks of the bank where the water stood. In the upper one it was all bare except about three quarters of an acre, the water was very muddy and stinking and there was a boat in it with a shovel where they were dipping up the scum that would rise to the top. I got in the batteau with the shovel as an ore and rode around and stuck down in the mud, the Mayor and myself and a hideous odor would rise from it.

Q. Wasn't it dead fish?

A. Not then, no, sir.

419 Q. Did you go there after that?

A. No, sir.

Q. What advice was given by you as city physician after you found such a bad state of affairs?

A. I expressed myself as a member of the Board of Health that it was unfit for anything to drink. I would not want a cow of mine to drink it.

Q. Did the city discontinue the use of it after that?

A. Shortly after that there was red water coming out of the pipes. I don't know where, but supposed it came from the river.

Q. How long was that used?

A. I could not tell you. Several months I think.

Q. Would you consider that fit water for domestic purposes?

A. No, sir.

Q. Why not, doctor?

A. Well, at that time it was full of mud and I would not want to drink it on general principles. I never was raised on it. I don't know any think about its purity.

Q. Do you know the situation above the City Mills dam with reference to the contour of the country, on the east bank of the river?

A. Yes, sir.

Q. Do you know where the sewerage from Rose Hill empties in and how it is carried off?

A. Sewers from the houses goes to the 26th Street sewer up there.

which drains a flat up there and then open ditches from the other houses goes down to what we know as the Mile Branch and comes on down through town and runs through Dark Alley and goes in just above the City Mills dam and has any quantity of filth with it down in there.

420 Q. You mean that portion of the town?

A. Yes, sir.

Q. How about Bibb City?

A. All that goes in there.

Q. What effect has that upon the water, in your judgment?

A. Would put in all the filth and the waste, vegetable and animal matter that is washed down, germs of every description mixed in, into the river.

Q. Have they had typhoid fever out in that direction within the last year or so?

A. Yes, sir; I have had several cases myself.

Q. These parties that had typhoid fever where would the sewerage from them run in?

A. It would be washed out and go down into the river.

Q. Above the City Mills dam?

A. Yes, sir.

Q. What effect would that have upon the water in the City Mills dam and below it?

A. My judgment is it would pollute it. Get in all these germs and might become poisonous.

Q. Would they or not be liable to get them if they got the water from the river below that dam?

A. That's the way I feel and that they would not get them out by filtration.

Cross-examination.

(By Mr. WIMBERLY:)

Q. The water is filtered now that they use?

A. I understand it is.

Q. Haven't you seen any of it?

A. It looks clear and pretty now.

Q. Haven't you used it?

A. Yes, sir; I drink it at the office.

Q. The water is all right now?

A. Looks very nicely.

421 Q. You have been city physician nearly ever since you have lived in town, haven't you?

A. Yes, sir.

Q. Who elects the city physician, council?

A. Yes, sir.

Q. You say as such city physician you are *ex-officio* member of the Board of Health?

A. Yes, sir.

Q. How many members have you of the board of health?

A. Nine.

Q. You have regular meetings and take regular proceedings looking to the health of the town?

A. We have a president and if he feels that there is anything up for our judgment a meeting is called.

Q. Haven't any of the others the right to report any matter that needs attention or do you have to wait until the president calls a meeting?

A. If any one suggests or the newspapers bring up anything——

Q. If anything exists that endangers the health any member of the Board takes it up?

A. I suppose he could.

Q. Isn't it his duty and isn't that what they are there for?

A. I suppose so.

Q. They never found it necessary to take any action with reference to this water, the quality of it, until 1902, did they?

A. That's the first time I remember going out there in an official capacity.

Q. Or of its being brought up at all?

A. In the Board of Health. That's the first time I remember.

Q. Members of the Board of Health are representative physicians of the town, are they not?

A. Yes, sir.

Q. To look after health conditions here. The only time you were ever out at the reservoirs when the water was low and in the condition you speak of was in '02, wasn't it?

422 A. Yes, sir.

Q. I believe you said you were out there at that time and several other times?

A. Yes, sir.

Q. They were all right when you were out there at the other times?

A. Yes, plenty of water there and nice fishing.

Q. Fish in the upper and lower reservoir-?

A. Yes, in both.

Q. Did you fish in the lower?

A. No, sir; wouldn't permit us.

Q. The lower reservoir was protected by rock walls and had a rock bottom, didn't it?

A. Yes, sir; I saw the rock walls. I didn't see the bottom.

Q. It was clear and apparently pure water with the exception of 1902?

A. Clear as any pond water. Not clear—you could not see very far in it.

Q. Clearer than ordinary pond water?

A. No, sir.

Q. Wasn't there a settling basin above that let the mud settle and the clear water would go into the lower reservoir?

A. It was larger and was not as clear as the one below.

Q. The mud settled at the bottom of it and left that clear, didn't it—the mud settled at the bottom of the reservoir and left the top of the upper reservoir perfectly clear, didn't it?

A. Yes, went on down and run in under the wall, I suppose.

Q. Then the water from that upper reservoir, the clear portion of it was drawn off to the lower reservoir, was it not?

423 A. I don't know how it got in there.

Q. Wasn't there a by-pass to carry off the storm water—rain water?

A. I think there was a sluice on that side.

Q. That was the purpose of it?

A. I suppose so.

Q. To protect it from the mud when it rained?

A. When it got too much for them to hold to let it go around.

Q. As long as you have been in the city you have known that by-pass to overflow more than once or twice?

A. I don't know, sir. I have seen muddy water coming out of the pipes; but I don't know how come it muddy.

Q. Of course you knew why it became muddy in 1902, didn't you?

A. It was rotten, stunk mightily,—slimy.

Q. Didn't you say something about red mud in 1902?

A. O, yes. I understood it was river water turned in. I thought you were speaking about the water in the reservoir.

Q. I was speaking of the water in the pipes?

A. Yes, sir.

Q. You knew that came from the river, didn't you?

A. By some one else telling me. I didn't go there to see.

Q. Couldn't you tell by the difference in the water yourself?

A. Yes, sir; tasted very much better than that you were getting out of the water works with all the mud in it.

Q. The mud you speak of, and slime, it was just the mud that comes down from the hill sides?

A. Yes, rotten vegetable matter—algea and different kinds of white plants that grow in there.

424 J. M. BAIRD, sworn by respondents, testified as follows:

(By Mr. WIMBISH:)

Q. What is your profession?

A. A physician.

Q. How long have you practised medicine?

A. About 13 years.

Q. How long have you lived in Columbus?

A. Since Oct. 1898.

Q. Have you practised your profession continuously since that time in this city?

A. Yes, sir.

Q. Are you familiar with the character of water furnished this city and its inhabitants by the Columbus Water Works Company?

A. Yes, sir; fairly so.

Q. State what the character of that water is generally, and if it varies how it varies and what particular seasons, if at particular seasons?

A. I have never been to the reservoir but one time and that was in the Spring of 1901. The water was clear so far as I could tell and was all right. Never been there during the Fall season since I have been in Columbus. I know in the Fall of 1901, I detected an odor to the water—a slight odor and instead of being clear it was a dark color due to that black mud, it seemed; and I sent to New York and got a Burkefield Filter, which was recommended as being the only filter that would take out the mud and germs also; and I remember that I used it that Fall and the water was fairly good after being filtered; but the next season, 1902, it had a very disagreeable odor as well as a bad color and I used the filter again but it still
425 had the odor after I had filtered it with this filter; and I found I could get this water out at Wildwood and I got that for some 2 or 3 months, a gentleman brought it there every morning and I got 3 or 4 gallons a day and did not use the other water at all except for ordinary purposes to wash things. I did use it for the bath tub. I filtered it with this filter and still it had a bad odor.

Q. Did you observe in '98 and '99—did you detect anything wrong with it?

A. Yes. I was not married then and was living with Dr. Schley—I don't know how many years we had been in the habit of doing it, at least all the time while I was out there, his milk man would bring in two gallons of water from his farm every morning and we used that water for two years, '98 and '99—rather the latter part of '98 and '99; so I didn't have any general observation of it then, because I had the other water.

Q. Why did you use it in preference to the Columbus Water Works Company's water?

A. Dr. Schley said the other was not wholesome, didn't think anybody ought to drink it and he had it there and I thought he was a pretty close observer, so I used it.

Q. What, in your judgment, would be the effect on the water in the river for the sewerage from Rose Hill and Bibb City to empty into it?

A. Well, it is obliged to contain more or less organic matter, which, we are taught is very injurious to the human system. It tends to lower one's vitality and of course it tends to disease to that extent.

426 Q. State whether or not doctor it contains specific germs?

A. Yes. You see it may contain organic matter and have no specific germs. Anything that will lower your vitality and if your vitality is lessened your resisting power is lessened which will produce low fevers, and things of that kind.

Q. I don't mean malaria in a technical sense, but these low fevers are called malaria or billiousness?

A. Yes.

Cross-examination.

(By Mr. WIMBERLY:)

Q. You spoke of the water in '98 and '99: Where did you get the water you used in 1900?

A. In 1900—it was a little better in 1900 I think, not sure, yes, I used the water works water then.

Q. The first time you detected any ordor was in the Fall of 1901?

A. Yes, sir.

Q. Then you got you a filter?

A. Yes.

Q. The season of 1902 was a season of very unusual drought, wasn't it, doctor?

A. Yes, it was indeed.

Q. Wasn't simply this source over here but all the streams and a great many of the wells showed the effect of it?

A. Yes, sir.

Q. You spoke of the drainage from Rose Hill and these sewers above that emptied into the river—above this pumping station, do you know that?

A. Why I have never been to the City Mills, I am not sure. I don't know, I have been told. I don't know.

Q. I don't mean the open surface but the drainage from the sewers?

A. They must. Surface closets on Rose Hill. May be
427 some sewers up there, I don't know.

Q. Ordinary river, when you consider the quantity of water the river contains, is not more polluted by the houses and villages along its course than the creeks and branches through this country, are they?

A. I think not.

Q. The river water properly filtered is very good water, isn't it?

A. Yes, sir.

Q. The water that is furnished now is all right, isn't it?

A. Seems to be—yes, I use it in my home.

Q. Cities the size of Columbus, all of them, except a few in the artesian belt, use river water, don't they?

A. Yes, that's my information.

Q. In portions of the country, like the New England States and Middle States, where the populations is very much more crowded than it is here in Georgia, the rivers really carry the drainage from a great many more houses than goes into the Chattahoochee River?

A. Yes, I think so.

Q. Philadelphia uses the Schuylkill water, doesn't it?

A. I don't know.

Q. Below cities with crowded populations above?

A. I think I have read it, yes.

Redirect examination.

(By Mr. WIMBISH:)

Q. In speaking about being associated with Dr. Schley in '98 and '99, did you mean the City Physician?

A. No, sir; Dr. Ed Schley—E. B. Schley—the old Dr. Schley—E. B. Schley.

428 Mr. WIMBERLY: That being so I will ask to rule out what Dr. Schley said.

The MASTER: The Statements that Dr. Schley made are not evidence. Not admissible.

Q. Is there any city on The Schuylkill above Philadelphia as large as Philadelphia?

A. I am sure, Mr. Wimbish, I don't know.

Q. Really what you say about that is all hearsay?

A. Yes, just hearsay. I have read several works on sanitation and recall some of those things somewhat; but I would not be positive about any of these facts.

Q. What would you say as to the effect on the quality of the river at this point of a large part of the sewerage from the City of Atlanta emptying into the river?

A. Owing very large to how close we are.

Q. From Atlanta?

A. I think the authorities vary—not agreed on that point. Some claim that water will purify itself in a certain number of miles, I disremember as to the number. The Chattahoochee, I think, would offer better advantages for purifying the water than most rivers; because of so many rocks the water is dashed up in sprays and the oxygen in the air oxidizes and burns up the organic matter.

Q. That's true of all streams in the mountains?

A. I presume so.

Q. Do you know whether typhoid fever germs have been carried by the rivers of Massachusetts as great a distance as from Atlanta to Columbus?

A. No, sir; I do not.

Q. Lowell, Mass: Do you recall an epedemic that they had
429 there within the last year or two of typhoid fever?

A. No, sir; I do not.

Q. Do you recall an epedemic they had in Pennsylvania during the past summer and autumn?

A. Some point up there. Not positive about the point. They have had a great deal of typhoid fever in Chicago as the result of the contamination of the water in Lake Michigan.

Q. Where did that contamination come from?

A. From the sewerage in Chicago into the Lake. I understand now the sewerage has been diverted into the Chicago River.

Q. Do you know what was the source of supply in Ithaca, New York?

A. Yes, I believe I recall reading it in my Medical Journal, not sure, but I think it was the river. Anyhow, the contamination came from typhoid patients on the water supply. It is a recognised fact that you can free typhoid germs and they will live indefinitely.

Recross-examination.

(By Mr. WIMBERLY:)

Q. Typhoid fever could get its germs in spring water where the water does not come from under an impervious strata of rock?

A. Yes.

Q. The sewerage of Chicago causing the pollution of the lake, was the entire sewerage of the City of Chicago, a city of a million and a half inhabitants, dumped into the lake very near where the water supply was drawn?

A. No, understand several miles from there in the lake where they get the water—anyhow it was polluted.

Q. The distance was such that it was polluted?

A. Yes, sir.

430 (By the MASTER:)

Q. From your general knowledge of the surroundings of Columbus, what would you say was the safest water supply that could be gotten for this city—what is your opinion about it?

A. I hardly know. That is a big problem and I would not know what to say about it.

Q. You have no opinion on that as a medical man?

A. No, I would not like to risk an opinion on it.

431 E. H. SIMS, sworn by the defense, testified as follows:

(By Mr. WIMBISH:)

Q. What is your profession?

A. Practising medicine and surgery.

Q. How long have you practised in this city?

A. Fifteen years.

Q. Are you familiar with the character of water that has been furnished by the Columbus Water Works Company?

A. I was up to 1902. I have not since. I have only used it for flushing since.

Q. Up to that time what was the character of the water?

A. Well, it differed—the water at a great many times was good during the winter and spring. The latter part of the Summer and Fall several times I remember I think it had more or less an odor, slight discoloration—unpleasant.

Q. You regard that water as wholesome and suitable for domestic use?

A. At several times I did not.

Q. At those times?

A. Yes, sir.

Q. Have you ever visited the reservoirs?

A. Yes, sir.

Q. How often were you there and what was their condition?

A. I have been out I don't know how many times in the last 15 years, I suppose half a dozen times; in the winter season and spring the pond was clear—fairly clear and very nice looking water.

Q. How was it in the summer time?

A. Poor appearance and not so good.

Q. What were the conditions in 1902 that caused you to
432 quit using the water?

A. Well, it was bad then, too bad to use at all.

Q. You mean for purposes of drinking?

A. For any purpose, bathing, drinking almost too bad to use in your closet.

Q. After the river water was pumped into the mains, did that improve the condition of the water?

A. Improved the odor very much.

Q. What was your objection to the river water?

A. Objectionable on account of the sand and mud and I was afraid of sewer contamination.

Q. Why?

A. On account of the drainage from Rose Hill and Bibb City—and really all the drainage from that Rose Hill Branch and Creek—watershed.

Q. How were the conditions in July and August and September, 1902, as threatening the health of the community?

A. Well, I would say that water was terrible, on account of it being foul and nauseating.

Q. What would have been its probable effect—threatening effect on the health of the people?

A. As it had no specific germ it could only lower the vitality and lessen the resistance and make any one a prey to any disease that came along.

Q. The effect would have been general?

A. General instead of producing any specific disease.

Q. There was not so much fear of any epedemic or any particular disease?

A. No, sir; the effect would have been general.

Cross-examination.

(By Mr. WIMBERLY:)

Q. You are not a member of the Board of Health?

A. I am.

433 Q. How long have you been?

A. I don't remember. Been several years though.

Q. Were you a member of the Board of Health in 1902?

A. Yes, I visited that puddle out there as a member.

Q. At the time this water was condemned?

A. Yes, I visited that pond out there at the time it was condemned.

Q. That's the first time you ever had an occasion to visit it for any such purpose?

A. That's the first time I ever visited it in an official capacity.

Q. That's the first time you ever visited it when you found it in any such condition?

A. The first time I ever visited it when I found it in as bad condition as that. I don't mean that it was in perfect condition the other times I visited it; because the upper reservoir had formed feather edges—settling pond—and it was full of vegetable matter and things, which to a certain extent will pollute the water.

Q. The ordinary vegetable matter that grows around a pond, edges of a pond, is not specially poisonous?

A. Well, except it would, as I said awhile ago, it contaminates the water; and while it might not produce any specific disease. it lowers the vitality of any one and weakens them and lets them down.

Q. In a large reservoir containing 40,000,000 gallons, the amount of vegetable matter, under ordinary conditions, that would be taken up by the water on the edges, would not be considerable, would it?

A. Taken up by the edges?

434 Q. I mean from the vegetable matter that would grow at the thin edges, yes?

A. The water there in the upper settling basin was entirely covered—the whole pond was covered up with vegetable matter and slime.

Q. You are speaking about 1902, ain't you?

A. Yes, sir.

Q. What I mean under ordinary conditions the quantity of water was such that a small amount of vegetable matter on the edges would not appreciably affect the quality of the water?

A. Unless it be relative—it would be owing to the proportion of the vegetable matter to the water as to how much it would absorbe and take up. If it was a small amount of water it would not absorb it to the extent it would a small amount of water.

Q. Water drawn from the surface, the clear water part, some distance from the vegetable matter, would be, under ordinary conditions clear—fairly pure water, wouldn't it?

A. You mean in 1902?

Q. I don't mean 1902, I mean those previous times?

A. Yes, previous times the water looked clear and fairly good. In 1902 there was a small flow into the lower pond and all this vegetable muck up above.

Q. When I say fairly good—I recognise in 1902 you found it muddy and slimy and condemned it. I was speaking about previous years?

A. It became low and had vegetable matter in it but in not enough proportions to produce any gas or unpleasant odors, except in the latter part of the summer and early Fall.

Q. Doctor, as I understand you then, except for a few short intervals, this water was very fair water prior to 1902, wasn't it?

435 A. Except in the Falls—several years in the Fall when we had droughts and the water was unusually low here, then the water, as I said, had a more or less unpleasant odor and we were afraid to use it for fear it might produce disease of some form.

Q. These droughts that were severe enough to affect the water, would they last very long?

A. Well, some years we would have long droughts and some of them would be very short; and some years we would have a great deal of rain fall and others would be light. Works of that kind depended upon the rain fall.

Q. There were not many years prior to 1902 that you had any very severe droughts, were there?

A. I don't remember now the years that we had the droughts.

Not farming and did not have anything specially to call my attention to the droughts or the years of the droughts.

Q. There were none of course that would compare with 1902?

A. I think that's the one they claimed the world was drying up; and I know that pond had.

Q. You say you have not seen or examined the water since the filter plant was put in?

A. I see it every day but I don't drink it.

Q. Quit drinking it since the filter plant was put in?

A. Quit drinking it before it was put in. Have not used it since because I don't think the filter plant could filter out the sewerage from Rose Hill and Bibb City, that water shed up there; and for that reason I was afraid to risk my family with it.

Q. Chemical filtration does remove dangerous ingredients in water?

A. It is owing to what sort of chemical filtration you have:

436 You mean throwing down a little alum? I don't think that is a great disinfectant.

Q. Did you ever examine the filter plant up here?

A. I have been there and seen it.

Q. Did you ever stop especially and look into and investigate the science of filtration?

A. I have to some extent. I have not gone very thoroughly into it. The only thing I was uneasy about, that plant was, I understood of only 50,000 capacity, I forgot how many, may be two or three—I don't remember the amount of water; and I was satisfied that it would not filter all of it.

Q. Your fears were that it would not filter all of it?

A. Might not be properly filtered. Might have contamination—germ contamination. If we had typhoid fever or any other diseases on that water shed the germs might drift into these pumps and we would get it as serious as they have had it at other places.

Q. Speaking of typhoid fever or any specific germs of that sort, almost any source of supply that you would select would have danger from that source?

A. O, yes, that has to be watched carefully always.

Q. Even springs, unless they are artesian springs?

A. Anywhere where you have percolation.

Q. From under a strata of rock it is liable to give you typhoid fever?

A. Good sand and clay—clay is better.

Q. I mean in the soil you have in this part of the country, spring water is liable——

A. Would be with sand.

Q. To give you typhoid fever?

A. If you had clay percolation very far——

Q. Depends upon the depth it would percolate through the

437 clay?

A. Yes, sir.

Q. Have you examined this filter yourself, or do you assume it is not big enough?

A. I only know they said it was of 50,000 gallon capacity.

Q. 50,000 gallons?
A. I think that's its daily capacity, what I understood.
Q. Daily capacity?
A. That's what I think. I don't know anything about that. That is a matter of hearsay. Only formed my opinion that I was afraid to drink it.
Q. You would not if it was two million gallons per day?
A. No, sir.

(By the MASTER:)

Q. From your general knowledge of the general surroundings of Columbus, what, in your opinion as a medical man, would be the safest and best source of supply for water for this city, if you have any opinion on that?
A. I have always been wedded to the mountain spring idea. That would satisfy me better as being more suitable for drinking water than the river, where there was, as we have here, a good large number of inhabitants with all the excretions and everything draining into it.
Q. There is no accessible mountain spring that could supply this city?
A. The only one I know would be what they call the Harris County water supply.
Q. You mean Blue Springs?
A. Blue Springs.

Redirect examination.

(By Mr. WIMBISH:)

Q. If typhoid fever germs will pass through sandy soil so as to contaminate spring water, will they pass through sand in a
438 filter?
A. O, yes, if it is not made absolutely water germ pure. You can relieve it of its sediment so as to make it look nicely.
Q. Which would be the more effective in removing germs, the natural soil of sand and clay around a spring or the sand in a filter?
A. Well, that would be a relative question because it would be owing to the amount of sand. If it was a natural settling, you might have a long distance for percolation, possibly for miles; while in a filter plant you would only have a short distance.
Q. Did you ever examine the suction pipe where the water is drawn from the river into the filter plant?
A. Yes, sir.
Q. Did you ever find anything objectionable to it?
A. The last time I was there I saw a dead beaver up against the gate with the hair and hide partially decayed and slipping from it, right above the pump.
Q. How far was that from the end of the pipe where the water comes in?
A. It was only a very short distance, half a foot—I don't know exactly. Right at the end of the pipe. Just up against the gate leading right to the pipe.

(By Mr. WIMBERLY:)

Q. This Blue Springs, you have seen that Spring: Do you know what its capacity is for a supply for a city the size of Columbus?

A. I have seen only estimates given.

Q. Have you ever seen the water itself?

A. Yes, drank it.

Q. Do you know what is the capacity of the spring?

439 A. No, sir; I do not. I have never tested the spring.

Q. You would not be able to form any estimate of the quantity it could supply?

A. That would be merely a matter of calculation.

Q. It is a fact that the water you can get from the spring is not adequate to supply a city as big as Columbus?

A. Not without additions, as has been proven over yonder.

Q. No city in the whole State, as big as Columbus, outside of the artesian belt, but what gets its water from rivers?

A. They don't take the river unless it is forced on them. It is a matter of last resort. Of course very large cities they are forced to do it to get a quantity sufficient. You are not getting quality then, you are getting quantity.

Q. As large as Columbus or nearly as large as Columbus, don't they have to go to the river to get their water?

A. As I have not investigated the different cities and their water supplies carefully, I could not very well state.

Q. You spoke of germs in the water: What was it you say you found in the suction pipe?

A. Dead otter or beaver—some kind of an animal.

Q. When was that?

A. In the Summer of 1902 or Fall.

Q. Right in the suction pipe?

A. I never said the suction pipe. Against the gate just above.

Q. Did you report it to the Board of Health?

A. No, sir.

Q. And you are a member of the Board of Health?

A. Yes. That was a thing that might occur most any time, as far as that was concerned. Wasn't palatable, I thought.

440 Make the boys want to drink beer or want something else, you know.

Q. That's a thing that a person could not very well have anticipated—prevented?

A. No, sir. Same idea about drinking all those excrements of those people up on the branches.

Q. That's the reason you prefer spring water?

A. Any danger of contamination, of course. All kinds of animal matter flowing into the thing, made me solicitous—might have spit out hairs.

Q. You think mountain spring water would be more palatable than river water?

A. Be more wholesome, more palatable and better every way.

441 W. L. BULLARD, sworn by the respondents, testified as follows:

(By Mr. MARTIN:)

Q. How long have you been living in Columbus?
A. About 20 years.
Q. What is your profession?
A. Physician.
Q. How long have you practised your profession?
A. How long have I been practising?
Q. Yes, sir?
A. About 22 or 23 years.
Q. Do you sustain any official relation to the City of Columbus?
A. Well, only President of the Board of Health.
Q. How long have you been president of the Board, doctor?
A. About 2 or 3 years.
Q. Were you connected with the board of health as a member prior to your being President of the Board?
A. Yes, sir.
Q. I will ask you if you have used the water furnished by the Columbus Water Works Company during the time you have lived in Columbus?
A. Yes, sir.
Q. Used it at your house?
A. Yes, sir.
Q. Well, what opportunities have you had to observe the quality of the water?
A. Well, I don't know exactly. I take the water and have an occasion to use it every day.

442 Q. What has been the quality of the water furnished by the Water Works Company during the last 20 years?

A. In the Winter time I consider the water all right to use; but in the Summer time I do not think it is fit to use. In fact I don't use it myself.
Q. Why is it not considered good in the summer?
A. Well, because the streams dry up and things become stagnant and I don't consider any stagnant water with scum all over it and stinking, anything like that, suitable for drinking purposes or any other kind of purposes.
Q. How frequently does that occur?
A. I don't know. I never visited the water works officially except once or twice: I mean that's when—in 1902 I went out there officially because I was President of the Board of Health and because the water got so I could not use it.
Q. What were the conditions then when *I* went out there?
A. That would be hard for me to picture. I don't think any man living could hardly picture that. I found the stream was completely dry, no inflow at all: the upper pond was nearly dry. I suppose it had some water in it, but it was very low and there was a lot of mud and decomposition, looked like all kind of matter, and the

sun coming down and dried the mud and things were foul. I was sorry I ever saw it.

Q. You spoke about the matter, I will ask you whether you noticed any animal matter, fish?

A. The last time I went out there there was some dead fish out there. The thing was covered with this green scum that forms on all stagnant water.

443 Q. What was the condition of the water in the lower reservoir?

A. That had scum on it too and the whole business was stagnant; and a little water draining from the upper pond to the lower pond.

Q. State whether or not it had an odor?

A. It had plenty of odor.

Q. State whether or not that water was being furnished to the city and its inhabitants for use at that time?

A. I suppose so. I guess that's where it came from. I don't know where else it could have come from.

Q. Well, did the Board of Health have an analysis made of that water along about that time?

A. Yes, sir.

Q. I will ask you to look at that paper, doctor. Is that the report the Board of Health received from Dr. McCandless? (Handing paper to witness.)

A. Yes, sir.

Q. Who sent the water on to Dr. McCandless?

A. Well, three of us appointed from the Board of Health.

Q. Were you one of the three?

A. Yes, sir. As I said, I went out there to see that pond and came back and some one found it out here—a reporter, I believe, telephoned me about the condition of the water; and I told him I rather not have anything said about it; that the next morning I would call the Board of Health together in regard to it. So we met that afternoon and all went out to the pond again; and then decided to have this analysis made.

444 Q. How was the water sent?

A. Sent in a demijohn.

Q. Was it glass?

A. Glass demijohn.

Q. How much water was sent?

A. I think it was a five gallon demijohn.

Q. Who filled the demijohn?

A. I think Dr. McDuffie.

Q. Were you present when it was filled?

A. Yes, sir. Dr. McDuffie, Mr. Ledsinger, Dr. Gautier and myself I think were the four.

Q. That's what you received back?

A. Yes, sir.

Q. How did you send it to Dr. McCandless?

A. We carried it around and took it from three faucets, some from my place, some from Dr. McDuffie's and some from a store out near

the depot, put it in a jug and had it hermetically sealed and sent by express.

Q. Look at that analysis as made by Dr. McCandless and say whether or not the analysis furnished there of that water is such as is fit for domestic use?

Mr. WIMBERLY: We object to that unless they follow it up by proving by the man who made it the correctness of it.

Objection overruled.

A. Well, if I had looked at this analysis and didn't know anything about the water of course I would not drink it. If a man had seen the water he would not have wanted any analysis not to drink it.

Q. You afterwards sent some water to Dr. McCandless in August, 1903, didn't you?

A. I disremember the exact time; but I did send some
445 after this time. That was after they turned on the river water.

Q. How did you send that?

A. Sent that in a jug.

Q. State whether or not that jug was clean?

A. Well, the sanitary inspector and the Mayor asked me to send some water there. The Board of Health didn't meet. Asked me if it was necessary for the Board to meet for some water to be sent up there for an analysis. I asked Mr. Ledsinger, who was the Sanitary Inspector, to come up home the next morning and he brought this jug. And we went out to the faucet, got the water—washed the jug out; and after that put the water in and took it to the express office and he and I had it hermetically sealed.

Q. Was the stopper a new stopper?

A. I disremember. I never noticed about the stopper—anything being wrong about the stopper. All I heard about the stopper was Dr. McCandless' testimony, what I read in the paper. I didn't observe anything wrong with it. I saw them put it in and put sealing wax over it, looked like. If there was any smell to it I didn't notice it. Didn't notice any filth about it. Could not say positively whether it was a new stopper or not. Didn't seem to have been used. Seems like if it had I would have noticed it.

Cross-examination.

(By Mr. WIMBERLY:)

Q. Does the Board of Health make annual reports?

A. What do you mean by annual reports?

446 Q. Reports to Council.

Mr. MARTIN: Just one moment, Mr. Wimberly:

(Examination by Mr. MARTIN, of counsel for respondents.)

Q. Doctor, do you know where they get the river water at present?

A. No, sir.

Q. Suppose they were to get it a short distance from the City

Mills' dam, out of the river, state whether or not in your opinion that water taken from the river at that point, would be proper water to furnish the people for domestic purposes?

A. I should not think so. I would not like to drink water from right below the mill there.

Q. Do you know anything about the situation above these dams with reference to drainage?

A. Above where?

Q. Above the city Mills' dam up there about Bibb City with reference to the drainage from the houses?

A. No, sir; I don't know anything about it up there. I think all the water drains into the river through those ravines. However I have never examined it.

Q. Is it a fact that they do drain into the river by these ravines?

A. I think so.

Q. What effect would that have upon the water in the river?

A. Like any other water, contaminate it, I suppose. The most serious trouble about sewerage water flowing into the river, as far as health was concerned, would be typhoid fever. If a patient
447 up on the hill had typhoid fever and their secretions were emptied into a place that drains into the river and should anybody drink that water they would be liable to have typhoid fever. As far as drinking water producing typhoid fever, water can be very filthy and be unpalatable, all like that and yet not produce fever; but a man knowing where the water came from would make it objectionable for drinking purposes; and a man may not know where the water came from, being perfectly clear and drink it with some comfort as far as health as concerned; and then again it might start an epedemic of typhoid fever, which makes it quite objectionable in my mind.

The MASTER: You mean from this particular locality?

A. I mean below any sewerage—any drainage.

The MASTER: What is your opinion about the river as a source of supply of water for this city, outside of that?

A. Well, if they didn't have the mills up there on North High lands and wouldn't put any more mills between here and West Point I think it would be elegant; but if they are going to put mills all along the river, I think it is very objectionable.

Cross-examination resumed.

(By Mr. WIMBERLY:)

Q. Does the Board of Health make reports to Council during the year of the condition of the health here?

A. If anything goes wrong in the city, any epedemics, anything like that, the President of the Board of Health generally calls the Board together and then they discuss the matter and if they find it advisable to advise council to do so and so, they do it. The
448 Board of Health can't do anything except advise council.

Q. Do you keep your proceedings in writing?

A. Yes, I think they keep a report of it.

Q. Wouldn't there be health reports if you keep health reports?
A. Yes, sir.
Q. Who keeps those?
A. The clerk of council.
Q. Clerk of council?
A. Yes, sir.
Q. They are not kept by the board of health?
A. The clerk of council is our secretary.

Mr. WIMBERLY: To save time going over these matters, our examination of Dr. Bullard will be very short, except that I want to ask him about certain things about their proceedings and I had rather have the minutes.

Q. You spoke of some water sent in a jug: You say you got that water in your back yard from a hydrant—from a faucet?
A. Yes, sir.
Q. At what time was that in the year?
A. I could not tell you the exact date.
Q. Wasn't it in August, 1903?
A. I say I could not tell you the exact date.
Q. Couldn't you refresh your recollection by looking at the certificate of analysis as to the time when you got it?
A. A day or two before that.
Q. It was a few days before August 17, 1903, wasn't it?
A. Yes, I think so, from that.
Q. Hadn't you and your family been away prior to that time?
A. No, sir.
449 Q. In August had you used the water?
A. Yes, sprinkled with it.
Q. That's the only purpose?
A. I don't know, perhaps some of them bathed in it, it is possible.
Q. Isn't it a fact that your yard has pipe what is known as black pipe?
A. I don't know what it is.
Q. Is it galvanized pipe?
A. Have no idea. Don't know what kind of pipe it is. I suppose it is like all the others.
Q. Hasn't it been in there a good long time?
A. Put in there when I built the house.
Q. How long has that been?
A. I built the house I think in 1892.
Q. Wasn't the pipe first used in Columbus by the plumbers what is known as black pipe and it corroded and rusted out and it had to be taken out and other pipe put in its place? Isn't that true about all over town?
A. I never had any to take out.
Q. You have never taken any out?
A. No pipe taken out at the place where I am living. They have got the same pipe that I put there. I don't know what kind of pipe it is. I built the house in 1892.
Q. Have you seen any of it since?

A. Yes, I think it is white pipe.

Q. Have you had any of it taken up?

A. No, sir. It is an easy matter to find out if you rather know positively about it.

Q. You say that you use the water?

A. Yes, sir.

450 Q. Constantly?

A. Use it about as constantly as you would in general use, but not for drinking purposes.

Q. Why did you select the hydrant in your yard?

A. Because we could get the jug under it easier. Water we use every day—hydrant water that we use every day, just the same as most any hydrant about the house—don't know about quite as frequent from that hydrant. It was high and could get the jug under it.

451 C. L. WILLIAMS, sworn by respondents, testified as follows:

(By Mr. MARTIN:)

Q. What is your profession?

A. I am a physician—practising physician.

Q. How long have you lived in the city?

A. Since '86.

Q. Have you been connected with council any time during that time?

A. Yes, sir.

Q. Do you occupy any other official relation to the city?

A. Yes, sir.

Q. What relation, doctor?

A. I was on the Board of Health and City Physician at one time.

Q. When were you city physician?

A. I really don't know. It has been—I was City Physician last, I believe it has been 10 or 12 years ago. I don't remember the exact date.

Q. What has been your opportunities for knowing the character of water furnished the city and citizens by the Columbus Water Works Company?

A. Only as a citizen. That's all. I never investigated it at all. I use it at home.

Q. What has been the character of the water furnished for domestic purposes?

A. Been very bad.

Q. Has it been bad continuously since '86?

A. Well, some years it was worse than others. My recollection is that whenever we would have a drought in the summer the water was much worse, had a bad odor and frequently muddy; and

452 then some summer months it would be clear one month and another month it would be very muddy and bad.

Q. That has been the character of the water since '86?

A. That's my recollection.

Q. Well, what would you say as to the fitness of this water for domestic purposes and drinking?

A. I don't think it is at all fit for either.

Q. Did you have any occasion to visit the water works reservoirs?

A. No, sir; never was out there. Don't know anything about it. Never was out there.

Q. Have you any recollection of the condition of the water in '95 and '98?

A. No, sir; I can't recall the years.

Q. Can't recall the years?

A. No, sir; can not.

Q. How about 1902?

A. I think that was the year before—let me see.

Q. Year before last?

A. Year before last it was very bad indeed. Never used the water. Could not use it at all.

Q. How did the people get water then for domestic purposes?

A. They bought water from the suburbs and used well water. At a number of places they used well water mostly.

Q. How about river water: When was it turned on and what was the character of that water?

A. When it was turned on?

Q. Do you remember whether it was turned on and the reservoir water was discontinued in the summer of '02?

A. Simply understood that. Don't know it to my certain
453 knowledge.

Q. Do you remember whether there was a period of time when the water was very muddy?

A. It was terrible all the summer nearly.

Q. Was it fit for use?

A. No, sir; could not use it at all for any purpose at my place at my home.

Q. Do you know where this filter plant is?

A. I do not.

Q. Suppose it is south of the City Mills—suppose they take their water south of the City Mills dam, what would you say, as a physician, as to whether or not that water would be proper water for drinking purposes?

A. I don't think it would be good water.

Q. Why not, doctor?

A. Well, on account of the sewerage emptying into it, I suppose, organic matter flowing into the river and every kind of stuff that goes into the river; and I don't think it would be good water.

Cross-examination.

(By Mr. WIMBERLY:)

Q. Are you a member of the present council?

A. No, sir; I am not.

Q. What years were you a member of council?

A. Well, I declare I don't remember. I believe I was elected in '97.

Q. What others?

A. Served only one term.

Q. '97 and '98?

A. I think so.

Q. What years did you say you were on the Board of Health?

A. I don't remember that. The Board of Health at that
454 time resigned: I think it was about 8 years ago—about eight or nine years ago.

Q. That the same time Dr. Grimes resigned?

A. Yes, Dr. Grimes was a member of the Board of Health at the time.

Q. The whole entire board resigned?

A. I believe, not right sure but I think perhaps one member staid on the board.

Q. That was the last time you were on the Board?

A. Yes, sir.

Q. How long were you on the Board of Health?

A. I don't remember. Perhaps 2 or 3 years, I don't remember.

Q. You were City Physician you say how long?

A. I don't remember whether I was city physician 3 or 4 years—possibly 4 years.

Q. Was that before you resigned from the Board of Health?

A. Yes.

Q. Before you were on the Board of Health?

A. Yes.

Q. Immediately before you went on the Board of Health?

A. Immediately before, yes—no, I don't remember about that. Perhaps about a year—perhaps the year before that. I don't remember the exact dates.

Q. I believe you say you never investigated either of the reservoirs of the water works system here?

A. No, sir.

Q. Never analyzed the water?

A. No, sir.

Q. Do you use the water yourself?

A. Use it now.

Q. I mean have you used it since you have been here?

A. Yes, sir.

455 Q. Use it still?

A. Yes, sir.

Q. How long have you used it?

A. I have used it ever since I have been here off and on. Sometimes I would not use it. My greatest objection to the water being used by my family, outside of its unhealthfulness, is the odor.

Q. Outside of what?

A. Outside of its being unhealthy water. Whether it is unhealthy or not I don't know.

Q. It sometimes has an odor?

A. Yes. That makes it objectionable.
Q. When does it have an odor?
A. Occasionally does now.
Q. You mean the filtered water has an odor?
A. Yes.
Q. That is peculiar to your premises. It is not general throughout the city?
A. I don't know. That's what I would like to find out. My entire family has complained of it.
Q. As far as your particular premises is concerned, filtering won't remove the odor?
A. No, sir. At times it is all right and then again there is an odor about it that is very repulsive to me.
Q. What sort of an odor is that?
A. I don't know. I don't know to what it is due.
Q. The same odor it had before it was filtered, on your premises?
A. Yes, sir.
Q. You spoke of the water sometimes being cloudy, when was that?
A. Muddy. I don't know exactly, 1902 it was muddy, I don't know, for two months—I don't know, might have been longer. I don't know how long. We quit using it entirely. My recollection is that every summer we would have muddy water.
456 Q. You would not say it was every summer?
A. No, I would not say it was every summer. It was very frequently the case we had muddy water. I don't remember the dates.
Q. When you had muddy water how long did it continue: Not speaking about 1902?
A. I don't remember about that.
Q. As much as a day?
A. O, longer than that. Sometimes it would be 4 or 5 or six days we would have muddy water.
Q. Do you remember any summer in which it continued as long as 4 or 5 or 6 days?
A. No, sir; I don't remember the dates.

(By the MASTER:)

Q. What, in your opinion, from your general knowledge of the surroundings of Columbus, what in your opinion, as a medical practitioner here of long years of standing, is the best source of water supply for Columbus?
A. Well, if you would go as far as Blue Springs I think that would be the best supply. I don't know anything about these creeks around here. If they afforded a sufficient quantity of water, I would think it would be better water than the river water.
Q. What do you think about river water?
A. Think it is very doubtful.

(By Mr. WIMBERLY:)

Q. Have you ever seen Blue Springs?

A. Yes, lived near it.
Q. Are you interested in it?
A. Not at all.
Q. You say now that you have lived near it?
457 A. I have lived near it, about a mile and a half.
Q. You know what the flow of Blue Springs is?
A. Have no idea.
Q. Is it over a million gallons per day?
A. I don't know. I know it is a very free, large spring.
Q. Isn't it a fact that outside of the artesian belt, cities the size of Columbus—no city the size of Columbus has found it practical to get a sufficient water supply the whole year around without going to the river, in the South?
A. I don't know, sir.
Q. You never investigated that?
A. No, sir.
Q. You don't know what the cost would be to get the water here from Blue Springs?
A. No, sir; it is a mountainous country though.
Q. Don't you remember at the time the survey was made—the surveyors employed by the Blue Springs people, proprietors of the Blue Springs, were looking into it, fixed it over a half million dollars to get it to the city?
A. Yes, sir.

458 J. M. CROOK, sworn by the respondents, testified as follows:

(By Mr. MARTIN:)

Q. What is your profession?
A. Practising medicine.
Q. How long have you practised?
A. Twenty years.
Q. How long have you lived in Columbus?
A. Little over nine years.
Q. Have you been a consumer of the water—a taker of the water furnished by the Columbus Water Works Co. during that time?
A. I take the water but I have not been a regular consumer, that is, not for drinking purposes. The first year I lived in Columbus I took the water for the first twenty months. I was living at a place where I used the water altogether. Since that time I have not used it for drinking purposes, only in the bath tub and on the lot where I keep my horse. For sometime have used it for my horse; but I don't use it at all and have not used it since the Fall of '96, for drinking purposes at all.
Q. Why not?
A. I have a cistern.
Q. Well, do you know the character of water that has been furnished during the nine years up to 1903?
A. I could not say that I know it. Of course I could see it there where my horse drank it and used it in the bath tub and could see it.
Q. What was the character of water?

istence so as to have had a chance to have questioned him about it; and I shall object to it coming in.

Mr. MARTIN: I did not know council or the city had had it made. Didn't know anything about it until a day or two ago, Mayor Chappell sent me this. If we had known of it we certainly would have shown it to him.

(By Mr. WIMBISH:)

Q. I will get you to look at that analysis and state what you know regarding the character of water showing such an analysis as that?

(Handing witness paper.)

Objected to and objection overruled.

A. It would be very impure. The chemist says "The analytical shows that this water is loaded with organic matter in a state of putrefaction, and is therefore unfit for drinking purposes." That's the organic matter I had reference to.

Q. Is decayed vegetable matter organic or inorganic?

A. I believe that would be styled organic matter and the animal matter would be organized matter.

489 Q. Are you familiar with physical situation between the City Mills' dam and the dam of the Columbus Power Co.

A. The physical situation?

Q. Yes.

A. In a general way I know about the difference between the two.

Q. Do you know whether or not there is a continuous pond of water between those two dams, that is, does the City Mills' dam back water to the foot of the Columbus Power Company's dam?

A. I believe such a condition did exist a few years ago.

Q. Has it been changed at all: Do you remember the condition: Do you recall the litigation that was had?

A. I don't remember except reading it in the newspaper. My recollection is that they permitted it to continue. I don't know.

The MASTER: State what you know:

A. I don't know.

Q. I will ask you if you know the point where the surface drainage from Bibb City enters the river—approximately the point?

A. Yes, sir.

Q. Is that in the pond caused by the City Mills' dam?

A. I don't know whether it reaches there or not; but I am disposed to think it does. It is just below the rapids—below the Columbus Power Company's dam a few hundred yards. My recollection it is where the top of that water reaches, I won't be certain.

Q. Do you know the current of the river at that point,

490 whether it is on the Georgia side or the Alabama side?

A. I don't know. My idea is that it would go towards the Alabama side and comes and strikes an angle at the Georgia side and makes a turn. That's my general impression.

Q. If this sewerage is discharged into the pond caused by the dam of the City Mills' Company, what effect would it have as to contaminating the whole pond?

A. I think it would contaminate the whole of it.

Q. Do you know where a large part of the surface drainage from Rose Hill empties into the river—I refer to the drainage about 19th street?

A. Yes, sir.

Q. Is that above the City Mills' dam?

A. I think it is right above it—right close to it.

Q. What effect would the discharge from that drainage have?

A. In dammed up water it would have a considerable contaminating effect; but it would depend, of course, upon the current—how much current there was.

Q. You mean the current of the drainage itself?

A. Yes, as it strikes it; and also the current in the stream. If it was practically a pond it would circulate.

Q. What would be the effect of a rain fall—a large rain fall—heavy rain fall?

A. It would radiate in the pond, the surface washings: You mean the effect on the water?

Q. I mean the effect on the drainage and on the water shed itself as well as the pond itself into which it empties?

491 A. In case of rain storms the surface is supposed to be washed off and any contaminated matter that might be on it is discharged into the larger streams. That's the way bodies of water become contaminated very largely.

Q. Mr. Wimberly asked you with reference to the health of this city: I will ask you whether that is due to the natural situation here, as to its natural surface drainage and its sandy soil?

A. I have always regarded the condition of the soil as one of the best elements we have, being conducive to good health—the sandy soil.

Question objected to as leading and objection sustained.

Q. To what is the good health of this city due, principally?

Mr. WIMBERLY: He has done answered it now and I don't insist upon his answering it again.

Q. Doctor, is the health record based upon the deaths only or sickness that don't result in death?

Mr. WIMBERLY: I object to that for the same reason that I did the other question. You are making suggestions.

Q. On what are the health records based?

A. Well, I should feel like asking you another question: You mean the deather rate? That's one way: we speak of a city's death rate per population, that is, the death rate irrespective of the general condition of the health; and then there is a health record which refers to the general health of the people—inhabitants.

Q. Now doctor, are there any records kept showing the health of various cities from diseases that do not result in death—any

492 authentic records?

A. I don't think there is any authentic records, no, sir.

Q. I will ask you how you judge of the general health of a com-

munity? How can you compare Columbus, Augusta, Atlanta, Nashville or Chattanooga unless you have the statistics to show?

A. In regard to the death rate, in my opinion, the only thing we have to go by, per population. But a man could find out these things in a general way by ascertaining whether they have a healthful section or not.

Q. How much does that depend upon inquiry in a community?

A. Depends a great deal.

Q. How much is it affected by local pride?

A. Very considerably.

Q. I will ask you whether diseases, such as low fevers, malaria and diseases of that kind, result in as large per centage of deaths as pneumonia, typhoid fever and those more acute diseases?

A. No, sir.

Q. Which are more common in a Southern latitude like this?

A. Malarial troubles, that class are more prevalent.

Q. Which are more directly due to an unwholesome water supply?

A. Malarial fever and the type of fevers that I referred to awhile ago as being unclassified.

(By Mr. WIMBERLY:)

Q. Do I understand you to say that vegetable matter is inorganic?

A. I believe I said that but upon reflection it is organic.

493 (Permission was here given witness to correct his answer previously given; and it appears in record as corrected—Stenographer.)

Q. The division is between mineral on one side and organic on the other?

A. Yes. I was going to ask later to allow me to correct that.

Q. Organic matter is anything that can decay, either vegetable matter or animal matter?

A. Can be separated into its component parts.

Q. It is the product of live growth subject to decay—death?

A. Yes, sir.

Q. Such as animals dying?

A. Yes.

Q. In technical or chemical language they putrefy or decay?

A. Yes.

Q. So that decayed, putrefied organic matter may be animal or vegetable?

A. Yes, sir.

Q. In speaking of health records, they not only show the number of deaths but show the cause of the death?

A. Yes, sir.

Q. You can tell whether it is a healthy community or not by the proportion of deaths in one as compared with the proportion of others?

A. In a general way you would, if you were—By way of illustra-

tion, if you see a representative physician of a place, you
494 would ask him as regards the health of the place. We have a great many of these little ailments or little spells of sickness that last a week with comparatively few deaths.

Q. Even with the same causes or types of causes that produce a great many little spells of sickness will produce certain fatalities?

A. That's right.

Q. Like malaria?

A. Yes, sir.

Q. Low fever sometimes kills?

A. Yes, sir.

Q. Malarial fever sometimes kills?

A. Yes. As I have said, low fever that is really not classified at all. Doctors, sometimes, when they are unable to call it typhoid or malarial fever, yet the patient has a little continued fever, week or ten days, they can't classify it.

Q. In other words: if you were to take the health reports from a large number of cities scattered over the country, those that are located in healthy localities, where the conditions are good and those that are located in unhealthy localities where the conditions are bad, you can see what diseases people die of and the proportion that die of certain diseases?

A. That is not absolutely true, for the reason that health resorts, for instance——

Q. Generally true?

A. In a general way they arrive at the conditions.

Q. Of course a health resort——

495 A. That must be taken into consideration. You would expect more deaths from malaria in the Mississippi Valley than you would——

Q. At a health resort you would have a man sick who would go there; but speaking about other localities, you could tell the amount of sickness at each by comparison?

A. In a general way.

Q. Even with lesser sickness, low fevers and things of that sort that do not kill, Columbus compares very favorably with sister cities?

A. In a general way.

496 TUESDAY MORNING, *March* 1, 1904.

Court met pursuant to recess and the hearing was resumed.

B. M. HALL, sworn by respondents, testified as follows:

(By Mr. WIMBISH:)

Q. Mr. Hall, what is your profession?

A. I am a hydraulic engineer, civil and mining engineer making a specialty of hydraulics.

Q. What has been your qualification for that profession?

A. Well, ever since the year 1880, I have been directly associated with the department of water supply and water power and the conveying of water in pipes, iron pipes and in every way that is necessary

to use, first in mining and afterwards in various ways. Ever since 1895 I have been the hydrographer for the United States Geological Survey, in the examination of water flowing in streams and making surveys and estimates for them; and I am now connected with the Reclamation Service in the west, irrigation schemes for the government in the west, as consulting engineer for the government.

Q. What was your college education?

A. I graduated at the Georgia University in 1876. I was elected to a professorship of mathematics at Dahlonega College, North Georgia Agricultural College, and was there four and one half years teaching mathematics and engineering.

Q. Are you a member of any society of civil engineers?

497 A. I am a member of the American Society of Civil Engineers and the American Institute of Mining Engineers.

Q. Are you acquainted with the plant of the Columbus Water Works Company?

A. Yes, I made an examination of it, not a very thorough examination of it, about ten years ago, and surveys and estimates; and I have seen it since frequently.

Q. Are you the B. M. Hall who made a report to the city of your investigations of this system in 1893?

A. I am.

Q. How did you find the system at that time with reference to reservoirs, where they were located, their character and capacity?

A. I found a storage reservoir and a clear water reservoir. The storage reservoir above what is intended for a clear water reservoir, both on Holland's Creek, about four miles from the city, at an elevation of something like 117 feet above Broad Street, the lower reservoir—top of the lower reservoir, which was the clear water basin. The storage in the storage reservoir was 39,000,000 and something—I have it exact—I can give the figures exact by referring to my notes. The capacity of the upper reservoir, which I call the storage reservoir, was 39,392,000 gallons, at that time; and the capacity of the clear water basin or lower reservoir, was supposed to be filled by drawing off the clear water from the upper reservoir into the lower reservoir, and was 12,078,000 gallons at that time.

498 Q. What was the length or dimensions of the upper reservoir?

A. The upper reservoir was—I have it here—I will have to count them up (witness figures). I estimated it at 2934 feet long—length of the reservoir as I have the figures here.

Mr. WIMBERLY: The upper?

WITNESS: 2934.

Q. Was it of marginal depths or thin edges?

A. In the construction of a reservoir for storing water, it is desirable and usual to make, where the water comes out along the hill slope where it is ponded up, instead of allowing it to run out on a thin, feather edge and run out to nothing, where it would be from a foot to one inch in depth, to have 8 or 10 feet along on the hill slope. Instead of doing that, it is usual to cut the bank down square and pile the dirt back, so as to make a square depth, so as not to be less

than four feet at the edge of the reservoir, where the water comes out to the hill side. It is usual to undertake to prevent any thin edges. The reason for that is this: if you get a sufficient depth of your water, it will not stagnate; because it won't get to the proper heat of stagnation, due to the temperature. The thickness of the water will prevent that. If it is four or five feet deep there, it will keep fresh, whereas, if it runs out to a thin edge, the depth of the water is so little, the sun shining down on it will heat the whole amount through to the bottom and will cause stagnation to set in in
499 the water; and that is the reason why it is generally specified that there should be no thin edges.

Q. What about the effect if the water recedes, gets down in the pond, leaving the bottom exposed?

A. It leaves, as it recedes, it leaves a large surface of material or a large surface of scum, where the water has occupied, and wet dirt and stagnation will set in and all that mud or selvage will cause objectionable qualities in the water—decomposition.

Q. Did you find any marginal depths in the upper reservoir, in 1893?

A. No, sir. In '93, there had been, so far as I could find, no place where there had been any attention paid to marginal depths. Simply just like building a mill pond—daming a mill pond and backing the water back and letting it take the natural slope of the hills, not only on the edges but on up the stream, no dam to prevent shallowness—a long stretch of shallow water. It is usual to cut that off in depths by excavation so there won't be any stretch of shallow water up the stream by backing it back, or quagmire among a lot of cat-tails and so on, as will happen by the filling in. At the upper edge of a pond, ordinary mill pond, you will frequently find that water will back off a long distance where it is only a foot deep, a very shallow basin; and that will grow up with vegetation, especially as the water is drawn down or the race fills up, it encourages the growth of vegetation; and it becomes simply a mud bottom with rank vegetation all over it; and the water will come up and occupy
500 that a little while and then it will go down again, owing to the draught that is on it. It is usual in constructing a storage reservoir to have a place where that will stop by putting a second dam up above and by cutting down and deepening it so it can't get shallow in places. And then this second dam serves as a means of turning away the flood water that brings down a large quantity of sediment and carries it around in a storm ditch. That is usual when a storage reservoir is made.

Q. You found that condition in this reservoir with respect to the growth of this vegetation, and the matter you speak of as growing, and that shallow water backed up the stream?

A. I found at the upper end of it large shallows; and there was more or less of that growth in it. I find by recent investigations that that has very largely increased and the water storage is largely diminished in the upper end owing to that fact. I made actual soundings and measurements in 1893, went on up the stream as far as there was back water that could be called storage. In 1903 I

again made these soundings and I found that all that upper end has been practically filled up with mud.

Q. How much in feet?

A. There would be 1100 or 1200 feet of it, in length, that has been actually filled in, so that there was nothing but a creek running through—shallow creek running through.

501 Q. Is that filling in the result of the washings from the hill-sides and matter brought down the stream?

Q. Yes, the result of deposit brought down during floods down the stream, and from the gullies, hill-sides and everything coming in. This material coming down the stream, slack water and stuff, has filled up that upper end, where its actual widths, as I measured it, were 100, 160, 130 and 64. Those were the different widths for 1200 feet to the upper end, beginning at the lower end, out where it has filled up. There is a bridge across there, or was at the time I made my measurements in 1893. From that bridge up practically everything is filled up. Whereas, at the bridge itself there was 100 feet width of waterway there and had a depth, maximum of five feet and an everage depth of 4 feet. Now it has about one foot depth under that bridge.

Q. How did you find this reservoir with respect to storm ditches or protection dams, were any there?

A. Absolutely no storm ditch. Nothing to carry the water around. No way in the world for the water to go but to run right into it and carry all of its sediment into this pond. Now the pond itself has the same relation to the clear water basin below, that an additional pond up above or an additional dam up above ought to have to it. Now there should be and should have always been a small dam across the stream that would turn the water into a storm ditch, at the time of a big flood, carry it around the whole system

502 and run it into the present storm ditch, so as not to let it go into the reservoir. There never has been anything of the kind at the upper reservoir, instead of that, the water has come down, bringing all the sediment and everything else it had in it right into the storage reservoir.

Q. How did you find conditions in 1903, they changed in any respect?

A. I found the conditions were the same. I found that the result of those conditions has shown itself to a marked degree in that ten years. The conditions existing at that time, the conditions of non-protection—it was not in any condition where it could be protected against material coming into it; and those same conditions now exist; and the result of those conditions show very clearly on the upper part of the upper reservoir.

Q. Is the upper reservoir a settling basin?

A. Yes, I should say it was. Water that would be allowed to stand in it would settle to some extent; and it would be much more so if it was larger—would be more of a settling basin. Where there is a constant draught on a reservoir of course it does not have a chance or time to settle as much as it would if there were not such a draught.

Q. If the reservoir were larger and better protected, it would serve better as a settling basin?

A. Yes, would not have as much stuff in it to settle, if it was properly protected.

503 Q. Mud and material from muddy water would not come into it?

A. No.

Q. Did you find any method of filtration of this water—any plan adopted for its purification?

Q. No, sir; there was nothing in the form of a filter that could be called a filter. There was a screen there to keep logs and trash out—heavy large trash from getting into the mains. A screen for that purpose, as is usual in any system where water is going into pipes—absolutely necessary.

Q. I understand there is a screen but not a filter?

A. No filter.

Q. How was that in 1903?

A. The same, was a screen, no filter.

Q. What is the size of the main from the reservoir to the city?

A. One foot?

Q. Internal diameter?

A. Yes, one foot internal diameter. That is what it was when it was laid. How much it has grown up I don't know.

Q. What do you mean by that?

A. I mean any incrustation that naturally forms on the inside of the pipe.

Q. Are these cast iron pipes?

A. I think so.

Q. Does cast iron pipe permit of incrustation or deterio-
504 rations?

A. It does. There are exceptional cases where cast iron pipe will last for a great many years without incrustation, while the very next joint of pipe will incrust; and it has been found impossible to get the secret or to know why it will do that. Nobody has ever found it out yet. There is always more or less pipe in any main—more or less pipe that will incrust more than others. There is no uniformity in the chemical composition. While some joints of pipe will incrust quicker and form barnacles on the side, other joints will remain clean in the water, owing to the chemical conditions of the iron itself.

Q. What is the cause of incrustation?

A. It is a decomposition of the iron, forming oxide of iron, in connection with any sediment or mud—any solid material that is in the water; and it makes something that approximates iron ore or iron rust; and it will form barnacles or lumps on the inside and gradually closes up the pipes—makes the opening smaller.

Q. Suppose this incrustation takes place only at one or two points on a main four miles long, what would be the effect upon the capacity of the main and flow of water through it?

A. It would decrease the capacity at the point where it would form and offer great resistance to the water. It would make a very

material difference in the amount of water that would come through it.

505 Q. I will ask you if the capacity of the main is determined by the smallest part of it?

A. Yes, to this extent: Of course the water at that point where it is small is obliged to acquire a very large—very much greater velocity than it has at other places. It gets some benefit from the effect of the clean portions of the pipe. It is not exactly as bad as if the whole pipe was plugged up. It breaks up the current—breaks the continuity of the flow; and takes up a great deal of the energy of the head that is pushing it through. It really makes more difference than the main friction in the pipe does.

Q. Did you find the same main in 1903 that you saw in 1893?

A. Found one that looked exactly like it. Said it was the same main.

Q. You found no evidence to indicate but what it was the main originally laid?

A. Well, all I know about it is the first time I saw it was in 1893.

Q. Did it give evidence then of being a new main or an old main?

A. Looked like an old main.

Q. Have you any means of knowing what would be the probable incrustation in a main of that character in 20 years and the reduction of capacity, if any?

A. Just at present I have not. I could not approximate it except to say that it would be very material. I would have to take time to figure it out. That is a question, you understand, that

506 would relate to experiment and knowing the actual facts to exist. I would have to look up those facts. I have not looked that up to see what that would be.

Q. What would be the theoretic capacity of a 12 inch main if it were unobstructed?

A. A 12 inch main, four miles long, straight, smooth, unobstructed, with a head equal to the present head on this main, if it were to be discharged in an open basin right on the ground at the foot of a standpipe, or if the standpipe were taken away, I will take it on the ground there, that water will pour into that hole 1495 gallons per minute, is my estimate of what the greatest quantity of water that could be expected to flow from that main under the pressure it has.

Q. That would be a little over 2,000,000 gallons per day?

A. Yes, practically two million gallons.

Q. What effect on the capacity does flowing into the standpipe have?

A. If the stand pipe is 120 feet high it takes 120 feet of head to fill it. That standpipe is really higher than the reservoir; so I would have to figure on a lower basis. The water should stand in the stand pipe on a level with the water in the reservoir.

Q. Then there would be no delivery?

A. There would be no delivery; but there would be pressure—hydrostatic pressure shown on the gauge. If you were to draw the

water from there, you would reduce the pressure as your water comes.

507 The MASTER: You mean draw it from the pipe or from the main?

WITNESS: Well, draw on it from the main.

Q. That reduces the pressure?

A. Yes; it would draw—as you draw down that head—as you produced a flow of water in that pipe, it takes a certain amount of this head to make that flow. If you get a certain velocity in that pipe and it takes two pounds of pressure to make that velocity, then you have not got that two pounds. You have reduced it down to 48 pounds instead of fifty. I have a tabulated statement that will give you an idea of it, on page 28 of my report. If you had a pressure gauge at the foot of the stand pipe, and if the water in the whole system were at rest, no *m*ater being drawn from the mains, water would stand on a same level in the stand pipe with whatever it is in the reservoir that it is drawn from; and it would give a pressure of 50.70 pounds. That is, it would show that on the pressure gauge.

Q. If the stand pipe was full?

A. Yes, and no water being drawn. If there was a consumption in the city of 278 gallons per minute, that would bring the pressure down to 48—it would lower the standpipe—it would have to lower the standpipe in order to get any flow from the reservoir into the standpipe. It would take two pounds of pressure to do that, which would be something over 4 feet—between four and five feet of head.

508 It would lower the standpipe, so that there would be a flow from the reservoir to the standpipe; and the pressure would be 48 pounds at the base of the stand pipe. If you were to use 630 gallons per minute in the city, the stand pipe would continue to fall until it got to a point where it would stand and allow you to use 630 gallons per minute and stay at that point and the pressure would be 40 pounds at the base of the stand pipe. If you were to use 1495 gallons a minute the stand pipe would be emptied. The head would be utilized in pushing the water through and you would have no pressure. If you were to get it out of a basin, let it pour into a basin on a level with Broad Street, and pump it out into the mains, it would give you a flow of 1495 gallons per minute, provided you had a clean, straight, unobstructed pipe line, one foot in diameter, four miles long.

The MASTER: What is that in million gallons per day?

A. About two million gallons.

Q. So if I understand you, if the consumption in this city should be two million gallons a day, it would absorb all that the pipe could possibly deliver and leave no pressure?

A. Leave no pressure. Take every bit of it for the delivery of the pipe and would leave absolutely no pressure on it. It would be water delivered at the level of Broad Street and would then have to be pumped—taken up and pumped into the mains in order to get any pressure.

509 Q. Could that be remedied by pumping into the standpipe?

The MASTER: Let me ask you a question: What effect, if any, would two mains have on that condition? You were about to get off on the question of pumping; and I would like to have that as a matter of information?

A. Lay a duplicate main?

The MASTER: Yes.

A. Of the same size as the one that is already in?

The MASTER: Yes, suppose you had two 12 inch mains?

A. Would double the amount of water that could be brought. Would not have any—would not make any more water up there; but would allow you to bring twice as much water as you would otherwise.

Q. What effect would it have upon the pressure?

A. It would double the amount of water that could be brought under a certain given head. For instance: instead of 630 gallons being the limit at which you could bring it at 40 pounds pressure, you could bring 1260 gallons under 40 pounds pressure.

Q. What effect would that have upon the pressure?

A. Well, it would not increase the hydrostatic pressure—the pressure would be the same in both cases if it were standing still. You understand the supply essentially affects the pressure. The amount of water that you can draw or that the city can use at any time, depends upon the amount of water that can be brought by the conduit four miles into the standpipe. Now then: if you can bring twice that amount of water, you can keep up your pressure—
510 your pressure will be greater. Now I can illustrate that from this table in this way: It would have this effect: Approximately four feet, one main, you could use only 278 gallons per minute with 48 pounds pressure. Now if you were to use 630 gallons per minute it would reduce it down to 40 pounds pressure. You could still use that 630 gallons per minute—if you had two mains you could use 630 gallons and have 48 pounds pressure. The two mains, with that particular draught on it, would raise the pressure 8 pounds. I think that answers it: With a given consumption the pressure would be higher.

Q. My question is: How would the situation be changed if the water were pumped from this side of the river into the standpipe?

A. Into the standpipe itself?

Q. Yes?

A. The question of supply main would be done away with. That is, we would not have to figure on how much water could be brought by that supply main into the standpipe. We could figure that two million gallons of water could be pumped into the standpipe, by getting the water from a loose end—from an open end to the standpipe; and as long as you used only two million gallons a day, the standpipe could be kept approximately full. The loss of pressure would be due entirely to the mains leading from the standpipe out into the city—ramification of the pipes in the streets. If
511 *If* they were large pipes you would have good pressure. If they were small pipes, you would have bad pressure, if you wanted much water.

Q. What makes up pressure—what are the elements that make up pressure?

A. The elements that cause pressure at a hydrant or at a cock in use?

Q. Yes?

A. There is one element that makes pressure and one element that takes off pressure. The element that makes pressure is the height at which the water stands in the standpipe. That makes hydrostatic pressure. If you draw a certain number of gallons per minute by means of flow in the mains from the stand pipe to the point at which it is taken out, and the faster that flow is the more pressure head it takes to put the water through there. If you have got 50 pounds pressure in this standpipe, it takes 20 pounds of that pressure to put water through the mains to the point where you are going; and you have got left only 30 pounds pressure, as would be shown on the pressure gauge put at that point.

Q. Suppose water is being drawn from that opening, how does it affect the pressure?

A. It affects the pressure just in proportion to whatever the friction is in this pipe. When we speak of friction in pipes, it is the resistence to the flow of water; and it takes a certain amount of that head to do it. For instance: when you are running a water wheel—I can illustrate it with water power probably better so it can be
512 understood better. If you are running a water wheel and you have 50 feet of head on that water wheel. If the pipe is large enough to bring all that water without any material friction, you have the advantage of a fifty foot head in running that water wheel and you get the horse power accordingly. If you undertake to bring the water down to a large water wheel through a six inch pipe, you would not get as much water through a six inch pipe as would take to run the water wheel; and whatever you did get through the pipe would be lost by pressure in getting it there. The pressure that otherwise could have been converted into power, has already been converted into power that is necessary to put the water through the main; and acts as a minus quantity at the orifice or at the point of delivery. So if you were to take an open end of a four inch pipe a good long distance from the stand pipe, and attempt to draw 600 gallons per minute through it, that much water would not flow through it at all. The size of the pipe limits the amount of water that can go through it at all; and there are cases where 600 gallons a minute could not go through that pipe with 92 foot or 90 foot pressure—with 50 pounds pressure on the standpipe. It would not be sufficient to make that water go through a four inch pipe some distance off.

Q. Let's get down to the facts as they exist in this system: If the pressure at the standpipe is 50 pounds—What is the size of the main leading from the standpipe to the hydrant at the corner of
513 First Avenue and 5th Street?

A. There is a great long stretch of four inch pipe along there, as shown by the map (plate III Hall's report), in my report, which I made from information obtained from the company—from

he water works company at that time. There would be a long stretch of four inch pipe between the stand pipe and the point mentioned. I have a statement here that I would like to refer to on that calculation that I made at the time that would be probably concentrated into better form, giving the reason why the system of using four inch pipe has been entirely abandoned. Engineers do not use *it* water mains any longer and the reason why they do not use it. Would you like for me to read that and explain it?

Q. I believe I will get you to read it and then explain it?

A. (Reading from report:) "The reason for this is apparent when we consider that in order to pass 300 gallons per minute through a four inch pipe a velocity of 7.65 feet per second is necessary, the friction of which will neutralize 5.58 feet of head for each 100 feet of pipe and that 600 gallons per minute requires a velocity of 15.72 feet per second and makes a friction that neutralizes 20.4 feet of head per 100 feet of pipe. If a smooth, straight 4 inch pipe 1648 feet long were attached to base of standpipe, and allowed to flow
514 from a free end, the discharge with a standpipe head of 92 feet would be 300 gallons per minute. In order for the discharge to be 600 gallons per minute the length of the pipe could not be greater than 450 feet. A hydrant at corner of Short and 9th Streets would have to contend with the friction on 1000 feet of four inch dead end pipe, in addition to some friction on other mains leading to it from standpipe. It could not possibly supply two streams of 300 gallons each per minute."

Q. What's the next clause?

A. (Reading from report:) "A hydrant at corner of Third Avenue and 8th Street could not supply two streams."

Q. Now explain?

A. In a system of water works, two things are generally aimed at. One is, when it comes to fire protection, fire pressure. First is to be able to get as much water as you need through any hydrant; and secondly: to get it with a pressure that will put out the fire—throw the water on top of the houses or buildings. Now of course if the mains are too small to get that water there, you not only lose your pressure, but you lose the chance of getting the water actually through there so that it could be taken up and pumped on the fire. If you wanted two fire streams taking 600 gallons per minute through a pipe 500 feet long and only four inches in diameter, leading from a stand pipe 92 feet—if the water stood 92 feet in it, you could not
515 get 600 gallons if it were poured out in a basin, or if you had a free end and a hole dug in the ground, or a reservoir or if you poured it into a pit or a well, it would not pour 600 gallons per minute. It would do it with a pipe 450 feet long, smooth, straight and clean pipe, no longer than that, it would yield enough to run two fire hydrants by pumping it into the hose pipe.

Q. After it ran that distance, at the hydrant end, would it have any pressure at all?

A. No, it would be like running into an open box or an open reservoir.

Q. How would that be affected by the pressure from Rose Hill, say

that stands 85 feet above Broad Street—Suppose the top of Rose Hill standpipe is 210 feet, how would the pressure from that affect this situation you speak of?

A. It would not do any good unless you had mains large enough to bring it there. If you had four inch mains it would not get there with as much pressure as it would from a nearer reservoir.

Q. How much of this system in 1893 consisted of four inch pipe and how much now, if you know how much, and how much 6 inch pipe; and what was the total length of the mains in Columbus?

A. 66,600 feet; and of this amount 55,000 feet was six inches and under, 24,500 of it being four inch pipe. That is according to a statement I made after a careful estimate.

516 Q. I will ask you how the situation would be changed if you had six inch pipe instead of four inch pipe?

A. It would be changed to the extent of the capacity of a six inch pipe over a four inch pipe.

Q. How much is that?

A. That would be in proportion to their squares: 6 x 6 36, and 4 x 4=16. It would be in proportion of 16 to 36—in other words: a little more than twice the capacity. A six inch pipe is a little more than twice the capacity of a four inch pipe.

Q. Instead of having a four inch pipe at the corner of Third Avenue and Ninth Street, you had a six inch pipe, how would that affect it?

A. You could never deliver over twice as much water.

Q. What would be the pressure at that point for one or two fire streams, actual effective pressure?

A. I don't know whether I have figured that out or not. If I can't recollect it without referring to it, I would have to take a little time to figure it out. I would rather have a little time to myself in making a calculation of that kind, because it requires very careful work in making a calculation like that. I remember I made some estimates of what could be done at different hydrants with the present mains—as they were at that time.

Q. Take the mains as they were in 1893, taking this point?

A. I think I have it here. Here's a statement on page 29 (referring to report), which will show what the conditions were at

517 that time with regard to fire service with the mains that actually existed.

Q. Please read and explain that?

A. On page 29. (Reading.) "In using steamers for fire pressure, the main question to be considered is the supply of water at the hydrants. In ordinary practice about 300 gallons per minute is required for a good fire stream. This is based on a discharge of 1⅛ inch nozzle, with sufficient pressure at the pump to overcome the friction of 100 feet 2½ inch hose and leave 90 pounds pressure at the nozzle. Two such streams should at least be used at any fire. If the fire has gotten under headway four such streams should be used. We can say then that a fire will take from 300 to 1,200 gallons per minute and in most cases will last less than an hour. It fre-

quently happens, however, that a fire will last for a much longer time. We will suppose a fire at the corner of Broad and 12th Streets. The hydrants there have the advantage of a ten inch main and of being within a short distance of the standpipe. Say the fire requires two streams taking an aggregate supply of 600 gallons per minute. Suppose when the fire begins the pressure is at 40 pounds, showing a domestic consumption of 632 gallons per minute, which added to the fire supply makes a total demand of 1,232 gallons per minute. The water in the standpipe has a depth of 92 feet, and it holds 2356 gallons for every foot of depth. During the first minute the conduit yields six hundred and thirty gallons and the stand pipe 600 gallons. The standpipe's surface will fall at the following
518 rate: 3 feet in 12 minutes; 6 feet in 26 minutes; 9 feet in 39 minutes; 18 feet in 90 minutes. At the end of 90 minutes from the beginning the conduit will be yielding 862 gallons and the standpipe 370 gallons per minute, while the pressure will be down to 32 pounds at the base of the standpipe and still falling."

Q. Suppose the fire, instead of being at the corner of Broad and 12th Streets, was at the corner of 9th St. and Short, under those conditions, what would be the pressure there?

A. You could not get water for two streams. That would be the condition there. You could not get water with any pressure at all for two streams, according to the way the pipe was at that time.

I go on to say if you should need four streams, which is not at all uncommon—very necessary to have plenty of water: Say you wanted four streams at that point—at this point, at the corner of Broad, at the most—at the best place in the city, closest to the stand pipe and on a ten inch main: (Reading from report) "If four streams are used, making with the domestic supply a total draught of 1832 gallons per minute, the stand pipe would fall 18 feet in 40 minutes; at the end of which time the pressure will be 32 pounds, the conduit will be bringing 852 gallons per minute into the city and the standpipe will be furnishing 970 gallons per minute and still falling at the rate of nearly 5 inches per minute.

519 If this draught of 1832 gallons per minute were continued, a point finally would be reached where the supply from the standpipe would become too small to make up the deficiency from the conduit. This point would be reached in three hours and 40 minutes from the time of beginning, at the end of which time the water in the standpipe would be only 9 feet and the pressure at its base only 3.9 pounds. From this instant it would be impossible to get the full supply of 1832 gallons, and the amount coming would constantly diminish until no water would come from the standpipe to assist the conduit. As the ultimate capacity of the conduit with the full head of 117 feet is only 1495 gallons per minute it would be unable to supply the full amount called for. This is an extreme case, of course and is given to show the limit of a domestic and fire supply, under the most favorable circumstances where the fire is close to the standpipe and has large mains to draw upon.

At a hydrant remotely situated and on a four inch main badly

connected with the general system, another difficulty arises, viz: the friction on the mains leading from the standpipe to the hydrant.

There are many locations in the city where water for two fire streams could not be supplied from a hydrant, even when there is 92 feet of water in the standpipe. The conditions entering into a hydrant discharge, when water comes from several directions in pipes that are variously connected, are too complex for calculation.

520 The velocities in the different pipes will be modified by so many causes that any attempt at an exact estimate of discharge will be useless."

I will add, however, that the estimates that are given, are intended to approximate the conditions that would exist as near as it is possible to make those calculations.

Q. Look at this map (handing witness map introduced in evidence by complainants): I call your attention to the location of the point called the Columbus Iron Works, where a fire occurred in 1902, April, on the corner of Short and Ninth Street, South of Dillingham: Suppose a fire of considerable magnitude were to break out at a point located on the map, Dillingham and 8th Street what amount of water would be available and what amount of pressure to fight that fire, whether it would be sufficient for the purpose, assuming further that the Rose Hill standpipe was at that time erected?

A. Well, in the case of the Rose Hill standpipe, you would either have to get the water from the Rose Hill standpipe or the other one. You could not get it from both of them at once, they being of different levels, that is, for the Rose Hill standpipe water to do any good. If you did it would run the other standpipe over.

Q. That is assuming the Rose Hill standpipe water was turned on and drawing from that standpipe?

A. With the system and mains as shown here?

The MASTER: And the fire between Dillingham and 8th Streets, West of Front?

WITNESS: And lasting how many hours, that is, what would be the extent of the fire, in other words?

521 Q. Suppose it lasted eight hours and resulted in a loss of $330,000 worth of property?

A. That's a new question that I would like to take into consideration and figure it out. I can do it quicker when I sit down and have time to think it over. It is a complex question. There are several mains coming to that point and I would not like to jump at a conclusion on it. I would like to have the indulgence of the court:

Mr. WIMBERLY: If the witness is going to do that, in order to get the benefit of it: I would like for the witness to make an estimate also on the basis of what it would be if the company had been notified to keep both of its pumps running to keep the Rose Hill Standpipe full, the pumps each having a capacity of 1000 gallons per minute and take of course the delivery according to the present system with the different connections, etc. that have been put in since he made his original map, pumping directly into the mains, so as to keep up that direct pressure there to supplement the original Rose

istence so as to have had a chance to have questioned him about it; and I shall object to it coming in.

Mr. MARTIN: I did not know council or the city had had it made. Didn't know anything about it until a day or two ago. Mayor Chappell sent me this. If we had known of it we certainly would have shown it to him.

(By Mr. WIMBISH:)

Q. I will get you to look at that analysis and state what you know regarding the character of water showing such an analysis as that?

(Handing witness paper.)

Objected to and objection overruled.

A. It would be very impure. The chemist says "The analytical shows that this water is loaded with organic matter in a state of putrefaction, and is therefore unfit for drinking purposes." That's the organic matter I had reference to.

Q. Is decayed vegetable matter organic or inorganic?

A. I believe that would be styled organic matter and the animal matter would be organized matter.

489 Q. Are you familiar with physical situation between the City Mills' dam and the dam of the Columbus Power Co.

A. The physical situation?

Q. Yes.

A. In a general way I know about the difference between the two.

Q. Do you know whether or not there is a continuous pond of water between those two dams, that is, does the City Mills' dam back water to the foot of the Columbus Power Company's dam?

A. I believe such a condition did exist a few years ago.

Q. Has it been changed at all: Do you remember the condition: Do you recall the litigation that was had?

A. I don't remember except reading it in the newspaper. My recollection is that they permitted it to continue. I don't know.

The MASTER: State what you know:

A. I don't know.

Q. I will ask you if you know the point where the surface drainage from Bibb City enters the river—approximately the point?

A. Yes, sir.

Q. Is that in the pond caused by the City Mills' dam?

A. I don't know whether it reaches there or not; but I am disposed to think it does. It is just below the rapids—below the Columbus Power Company's dam a few hundred yards. My recollection it is where the top of that water reaches, I won't be certain.

Q. Do you know the current of the river at that point,
490 whether it is on the Georgia side or the Alabama side?

A. I don't know. My idea is that it would go towards the Alabama side and comes and strikes an angle at the Georgia side and makes a turn. That's my general impression.

Q. If this sewerage is discharged into the pond caused by the dam of the City Mills' Company, what effect would it have as to contaminating the whole pond?

A. I think it would contaminate the whole of it.

Q. Do you know where a large part of the surface drainage from Rose Hill empties into the river—I refer to the drainage about 19th street?

A. Yes, sir.

Q. Is that above the City Mills' dam?

A. I think it is right above it—right close to it.

Q. What effect would the discharge from that drainage have?

A. In dammed up water it would have a considerable contaminating effect; but it would depend, of course, upon the current—how much current there was.

Q. You mean the current of the drainage itself?

A. Yes, as it strikes it; and also the current in the stream. If it was practically a pond it would circulate.

Q. What would be the effect of a rain fall—a large rain fall—heavy rain fall?

A. It would radiate in the pond, the surface washings: You mean the effect on the water?

Q. I mean the effect on the drainage and on the water shed itself as well as the pond itself into which it empties?

491 A. In case of rain storms the surface is supposed to be washed off and any contaminated matter that might be on it is discharged into the larger streams. That's the way bodies of water become contaminated very largely.

Q. Mr. Wimberly asked you with reference to the health of this city: I will ask you whether that is due to the natural situation here, as to its natural surface drainage and its sandy soil?

A. I have always regarded the condition of the soil as one of the best elements we have, being conducive to good health—the sandy soil.

Question objected to as leading and objection sustained.

Q. To what is the good health of this city due, principally?

Mr. WIMBERLY: He has done answered it now and I don't insist upon his answering it again.

Q. Doctor, is the health record based upon the deaths only or sickness that don't result in death?

Mr. WIMBERLY: I object to that for the same reason that I did the other question. You are making suggestions.

Q. On what are the health records based?

A. Well, I should feel like asking you another question: You mean the deather rate? That's one way: we speak of a city's death rate per population, that is, the death rate irrespective of the general condition of the health; and then there is a health record which refers to the general health of the people—inhabitants.

Q. Now doctor, are there any records kept showing the health of various cities from diseases that do not result in death—any

492 authentic records?

A. I don't think there is any authentic records, no, sir.

Q. I will ask you how you judge of the general health of a com-

munity? How can you compare Columbus, Augusta, Atlanta, Nashville or Chattanooga unless you have the statistics to show?

A. In regard to the death rate, in my opinion, the only thing we have to go by, per population. But a man could find out these things in a general way by ascertaining whether they have a healthful section or not.

Q. How much does that depend upon inquiry in a community?

A. Depends a great deal.

Q. How much is it affected by local pride?

A. Very considerably.

Q. I will ask you whether diseases, such as low fevers, malaria and diseases of that kind, result in as large per centage of deaths as pneumonia, typhoid fever and those more acute diseases?

A. No, sir.

Q. Which are more common in a Southern latitude like this?

A. Malarial troubles, that class are more prevalent.

Q. Which are more directly due to an unwholesome water supply?

A. Malarial fever and the type of fevers that I referred to awhile ago as being unclassified.

(By Mr. WIMBERLY:)

Q. Do I understand you to say that vegetable matter is inorganic?

A. I believe I said that but upon reflection it is organic.

493 (Permission was here given witness to correct his answer previously given; and it appears in record as corrected—Stenographer.)

Q. The division is between mineral on one side and organic on the other?

A. Yes. I was going to ask later to allow me to correct that.

Q. Organic matter is anything that can decay, either vegetable matter or animal matter?

A. Can be separated into its component parts.

Q. It is the product of live growth subject to decay—death?

A. Yes, sir.

Q. Such as animals dying?

A. Yes.

Q. In technical or chemical language they putrefy or decay?

A. Yes.

Q. So that decayed, putrefied organic matter may be animal or vegetable?

A. Yes, sir.

Q. In speaking of health records, they not only show the number of deaths but show the cause of the death?

A. Yes, sir.

Q. You can tell whether it is a healthy community or not by the proportion of deaths in one as compared with the proportion of others?

A. In a general way you would, if you were—By way of illustra-

tion, if you see a representative physician of a place, you
494 would ask him as regards the health of the place. We have a great many of these little ailments or little spells of sickness that last a week with comparatively few deaths.

Q. Even with the same causes or types of causes that produce a great many little spells of sickness will produce certain fatalities?

A. That's right.

Q. Like malaria?

A. Yes, sir.

Q. Low fever sometimes kills?

A. Yes, sir.

Q. Malarial fever sometimes kills?

A. Yes. As I have said, low fever that is really not classified at all. Doctors, sometimes, when they are unable to call it typhoid or malarial fever, yet the patient has a little continued fever, week or ten days, they can't classify it.

Q. In other words; if you were to take the health reports from a large number of cities scattered over the country, those that are located in healthy localities, where the conditions are good and those that are located in unhealthy localities where the conditions are bad, you can see what diseases people die of and the proportion that die of certain diseases?

A. That is not absolutely true, for the reason that health resorts, for instance——

Q. Generally true?

A. In a general way they arrive at the conditions.

Q. Of course a health resort——

495 A. That must be taken into consideration. You would expect more deaths from malaria in the Mississippi Valley than you would——

Q. At a health resort you would have a man sick who would go there; but speaking about other localities, you could tell the amount of sickness at each by comparison?

A. In a general way.

Q. Even with lesser sickness, low fevers and things of that sort that do not kill, Columbus compares very favorably with sister cities?

A. In a general way.

496 TUESDAY MORNING, *March* 1, 1904.

Court met pursuant to recess and the hearing was resumed.

B. M. HALL, sworn by respondents, testified as follows:

(By Mr. WIMBISH:)

Q. Mr. Hall, what is your profession?

A. I am a hydraulic engineer, civil and mining engineer making a specialty of hydraulics.

Q. What has been your qualification for that profession?

A. Well, ever since the year 1880, I have been directly associated with the department of water supply and water power and the conveying of water in pipes, iron pipes and in every way that is necessary

to use, first in mining and afterwards in various ways. Ever since 1895 I have been the hydrographer for the United States Geological Survey, in the examination of water flowing in streams and making surveys and estimates for them; and I am now connected with the Reclamation Service in the west, irrigation schemes for the government in the west, as consulting engineer for the government.

Q. What was your college education?

A. I graduated at the Georgia University in 1876. I was elected to a professorship of mathematics at Dahlonega College, North Georgia Agricultural College, and was there four and one half years teaching mathematics and engineering.

Q. Are you a member of any society of civil engineers?

497 A. I am a member of the American Society of Civil Engineers and the American Institute of Mining Engineers.

Q. Are you acquainted with the plant of the Columbus Water Works Company?

A. Yes, I made an examination of it, not a very thorough examination of it, about ten years ago, and surveys and estimates; and I have seen it since frequently.

Q. Are you the B. M. Hall who made a report to the city of your investigations of this system in 1893?

A. I am.

Q. How did you find the system at that time with reference to reservoirs, where they were located, their character and capacity?

A. I found a storage reservoir and a clear water reservoir. The storage reservoir above what is intended for a clear water reservoir, both on Holland's Creek, about four miles from the city, at an elevation of something like 117 feet above Broad Street, the lower reservoir—top of the lower reservoir, which was the clear water basin. The storage in the storage reservoir was 39,000,000 and something—I have it exact—I can give the figures exact by referring to my notes. The capacity of the upper reservoir, which I call the storage reservoir, was 39,392,000 gallons, at that time; and the capacity of the clear water basin or lower reservoir, was supposed to be filled by drawing off the clear water from the upper reservoir into the lower reservoir, and was 12,078,000 gallons at that time.

498 Q. What was the length or dimensions of the upper reservoir?

A. The upper reservoir was—I have it here—I will have to count them up (witness figures). I estimated it at 2934 feet long—length of the reservoir as I have the figures here.

Mr. WIMBERLY: The upper?

WITNESS: 2934.

Q. Was it of marginal depths or thin edges?

A. In the construction of a reservoir for storing water, it is desirable and usual to make, where the water comes out along the hill slope where it is ponded up, instead of allowing it to run out on a thin, feather edge and run out to nothing, where it would be from a foot to one inch in depth, to have 8 or 10 feet along on the hill slope. Instead of doing that, it is usual to cut the bank down square and pile the dirt back, so as to make a square depth, so as not to be less

than four feet at the edge of the reservoir, where the water comes out to the hill side. It is usual to undertake to prevent any thin edges. The reason for that is this: if you get a sufficient depth of your water, it will not stagnate; because it won't get to the proper heat of stagnation, due to the temperature. The thickness of the water will prevent that. If it is four or five feet deep there, it will keep fresh, whereas, if it runs out to a thin edge, the depth of the water is so little, the sun shining down on it will heat the whole amount through to the bottom and will cause stagnation to set in in
499 the water; and that is the reason why it is generally specified that there should be no thin edges.

Q. What about the effect if the water recedes, gets down in the pond, leaving the bottom exposed?

A. It leaves, as it recedes, it leaves a large surface of material or a large surface of scum, where the water has occupied, and wet dirt and stagnation will set in and all that mud or selvage will cause objectionable qualities in the water—decomposition.

Q. Did you find any marginal depths in the upper reservoir, in 1893?

A. No, sir. In '93, there had been, so far as I could find, no place where there had been any attention paid to marginal depths. Simply just like building a mill pond—daming a mill pond and backing the water back and letting it take the natural slope of the hills, not only on the edges but on up the stream, no dam to prevent shallowness—a long stretch of shallow water. It is usual to cut that off in depths by excavation so there won't be any stretch of shallow water up the stream by backing it back, or quagmire among a lot of cat-tails and so on, as will happen by the filling in. At the upper edge of a pond, ordinary mill pond, you will frequently find that water will back off a long distance where it is only a foot deep, a very shallow basin; and that will grow up with vegetation, especially as the water is drawn down or the race fills up, it encourages the growth of vegetation; and it becomes simply a mud bottom with rank vegetation all over it; and the water will come up and occupy
500 that a little while and then it will go down again, owing to the draught that is on it. It is usual in constructing a storage reservoir to have a place where that will stop by putting a second dam up above and by cutting down and deepening it so it can't get shallow in places. And then this second dam serves as a means of turning away the flood water that brings down a large quantity of sediment and carries it around in a storm ditch. That is usual when a storage reservoir is made.

Q. You found that condition in this reservoir with respect to the growth of this vegetation, and the matter you speak of as growing, and that shallow water backed up the stream?

A. I found at the upper end of it large shallows; and there was more or less of that growth in it. I find by recent investigations that that has very largely increased and the water storage is largely diminished in the upper end owing to that fact. I made actual soundings and measurements in 1893, went on up the stream as far as there was back water that could be called storage. In 1903 I

again made these soundings and I found that all that upper end has been practically filled up with mud.

Q. How much in feet?

A. There would be 1100 or 1200 feet of it, in length, that has been actually filled in, so that there was nothing but a creek running through—shallow creek running through.

501 Q. Is that filling in the result of the washings from the hill-sides and matter brought down the stream?

Q. Yes, the result of deposit brought down during floods down the stream, and from the gullies, hill-sides and everything coming in. This material coming down the stream, slack water and stuff, has filled up that upper end, where its actual widths, as I measured it, were 100, 160, 130 and 64. Those were the different widths for 1200 feet to the upper end, beginning at the lower end, out where it has filled up. There is a bridge across there, or was at the time I made my measurements in 1893. From that bridge up practically everything is filled up. Whereas, at the bridge itself there was 100 feet width of waterway there and had a depth, maximum of five feet and an everage depth of 4 feet. Now it has about one foot depth under that bridge.

Q. How did you find this reservoir with respect to storm ditches or protection dams, were any there?

A. Absolutely no storm ditch. Nothing to carry the water around. No way in the world for the water to go but to run right into it and carry all of its sediment into this pond. Now the pond itself has the same relation to the clear water basin below, that an additional pond up above or an additional dam up above ought to have to it. Now there should be and should have always been a small dam across the stream that would turn the water into a storm ditch, at the time of a big flood, carry it around the whole system

502 and run it into the present storm ditch, so as not to let it go into the reservoir. There never has been anything of the kind at the upper reservoir, instead of that, the water has come down, bringing all the sediment and everything else it had in it right into the storage reservoir.

Q. How did you find conditions in 1903, they changed in any respect?

A. I found the conditions were the same. I found that the result of those conditions has shown itself to a marked degree in that ten years. The conditions existing at that time, the conditions of non-protection—it was not in any condition where it could be protected against material coming into it; and those same conditions now exist; and the result of those conditions show very clearly on the upper part of the upper reservoir.

Q. Is the upper reservoir a settling basin?

A. Yes, I should say it was. Water that would be allowed to stand in it would settle to some extent; and it would be much more so if it was larger—would be more of a settling basin. Where there is a constant draught on a reservoir of course it does not have a chance or time to settle as much as it would if there were not such a draught.

Q. If the reservoir were larger and better protected, it would serve better as a settling basin?

A. Yes, would not have as much stuff in it to settle, if it was properly protected.

503 Q. Mud and material from muddy water would not come into it?

A. No.

Q. Did you find any method of filtration of this water—any plan adopted for its purification?

Q. No, sir; there was nothing in the form of a filter that could be called a filter. There was a screen there to keep logs and trash out—heavy large trash from getting into the mains. A screen for that purpose, as is usual in any system where water is going into pipes—absolutely necessary.

Q. I understand there is a screen but not a filter?

A. No filter.

Q. How was that in 1903?

A. The same, was a screen, no filter.

Q. What is the size of the main from the reservoir to the city?

A. One foot?

Q. Internal diameter?

A. Yes, one foot internal diameter. That is what it was when it was laid. How much it has grown up I don't know.

Q. What do you mean by that?

A. I mean any incrustation that naturally forms on the inside of the pipe.

Q. Are these cast iron pipes?

A. I think so.

504 Q. Does cast iron pipe permit of incrustation or deteriorations?

A. It does. There are exceptional cases where cast iron pipe will last for a great many years without incrustation, while the very next joint of pipe will incrust; and it has been found impossible to get the secret or to know why it will do that. Nobody has ever found it out yet. There is always more or less pipe in any main—more or less pipe that will incrust more than others. There is no uniformity in the chemical composition. While some joints of pipe will incrust quicker and form barnacles on the side, other joints will remain clean in the water, owing to the chemical conditions of the iron itself.

Q. What is the cause of incrustation?

A. It is a decomposition of the iron, forming oxide of iron, in connection with any sediment or mud—any solid material that is in the water; and it makes something that approximates iron ore or iron rust; and it will form barnacles or lumps on the inside and gradually closes up the pipes—makes the opening smaller.

Q. Suppose this incrustation takes place only at one or two points on a main four miles long, what would be the effect upon the capacity of the main and flow of water through it?

A. It would decrease the capacity at the point where it would form and offer great resistance to the water. It would make a very

material difference in the amount of water that would come through it.

505 Q. I will ask you if the capacity of the main is determined by the smallest part of it?

A. Yes, to this extent: Of course the water at that point where it is small is obliged to acquire a very large—very much greater velocity than it has at other places. It gets some benefit from the effect of the clean portions of the pipe. It is not exactly as bad as if the whole pipe was plugged up. It breaks up the current—breaks the continuity of the flow; and takes up a great deal of the energy of the head that is pushing it through. It really makes more difference than the main friction in the pipe does.

Q. Did you find the same main in 1903 that you saw in 1893?

A. Found one that looked exactly like it. Said it was the same main.

Q. You found no evidence to indicate but what it was the main originally laid?

A. Well, all I know about it is the first time I saw it was in 1893.

Q. Did it give evidence then of being a new main or an old main?

A. Looked like an old main.

Q. Have you any means of knowing what would be the probable incrustation in a main of that character in 20 years and the reduction of capacity, if any?

A. Just at present I have not. I could not approximate it except to say that it would be very material. I would have to take time to figure it out. That is a question, you understand, that 506 would relate to experiment and knowing the actual facts to exist. I would have to look up those facts. I have not looked that up to see what that would be.

Q. What would be the theoretic capacity of a 12 inch main if it were unobstructed?

A. A 12 inch main, four miles long, straight, smooth, unobstructed, with a head equal to the present head on this main, if it were to be discharged in an open basin right on the ground at the foot of a standpipe, or if the standpipe were taken away, I will take it on the ground there, that water will pour into that hole 1495 gallons per minute, is my estimate of what the greatest quantity of water that could be expected to flow from that main under the pressure it has.

Q. That would be a little over 2,000,000 gallons per day?

A. Yes, practically two million gallons.

Q. What effect on the capacity does flowing into the standpipe have?

A. If the stand pipe is 120 feet high it takes 120 feet of head to fill it. That standpipe is really higher than the reservoir; so I would have to figure on a lower basis. The water should stand in the stand pipe on a level with the water in the reservoir.

Q. Then there would be no delivery?

A. There would be no delivery; but there would be pressure—hydrostatic pressure shown on the gauge. If you were to draw the

water from there, you would reduce the pressure as your water comes.

507 The MASTER: You mean draw it from the pipe or from the main?

WITNESS: Well, draw on it from the main.

Q. That reduces the pressure?

A. Yes; it would draw—as you draw down that head—as you produced a flow of water in that pipe, it takes a certain amount of this head to make that flow. If you get a certain velocity in that pipe and it takes two pounds of pressure to make that velocity, then you have not got that two pounds. You have reduced it down to 48 pounds instead of fifty. I have a tabulated statement that will give you an idea of it, on page 28 of my report. If you had a pressure gauge at the foot of the stand pipe, and if the water in the whole system were at rest, no *m*ater being drawn from the mains, water would stand on a same level in the stand pipe with whatever it is in the reservoir that it is drawn from; and it would give a pressure of 50.70 pounds. That is, it would show that on the pressure gauge.

Q. If the stand pipe was full?

A. Yes, and no water being drawn. If there was a consumption in the city of 278 gallons per minute, that would bring the pressure down to 48—it would lower the standpipe—it would have to lower the standpipe in order to get any flow from the reservoir into the standpipe. It would take two pounds of pressure to do that, which would be something over 4 feet—between four and five feet of head.

508 It would lower the standpipe, so that there would be a flow from the reservoir to the standpipe; and the pressure would be 48 pounds at the base of the stand pipe. If you were to use 630 gallons per minute in the city, the stand pipe would continue to fall until it got to a point where it would stand and allow you to use 630 gallons per minute and stay at that point and the pressure would be 40 pounds at the base of the stand pipe. If you were to use 1495 gallons a minute the stand pipe would be emptied. The head would be utilized in pushing the water through and you would have no pressure. If you were to get it out of a basin, let it pour into a basin on a level with Broad Street, and pump it out into the mains, it would give you a flow of 1495 gallons per minute, provided you had a clean, straight, unobstructed pipe line, one foot in diameter, four miles long.

The MASTER: What is that in million gallons per day?

A. About two million gallons.

Q. So if I understand you, if the consumption in this city should be two million gallons a day, it would absorb all that the pipe could possibly deliver and leave no pressure?

A. Leave no pressure. Take every bit of it for the delivery of the pipe and would leave absolutely no pressure on it. It would be water delivered at the level of Broad Street and would then have to be pumped—taken up and pumped into the mains in order to get any pressure.

509 Q. Could that be remedied by pumping into the standpipe?

The MASTER: Let me ask you a question: What effect, if any, would two mains have on that condition? You were about to get off on the question of pumping; and I would like to have that as a matter of information?

A. Lay a duplicate main?

The MASTER: Yes.

A. Of the same size as the one that is already in?

The MASTER: Yes, suppose you had two 12 inch mains?

A. Would double the amount of water that could be brought. Would not have any—would not make any more water up there; but would allow you to bring twice as much water as you would otherwise.

Q. What effect would it have upon the pressure?

A. It would double the amount of water that could be brought under a certain given head. For instance: instead of 630 gallons being the limit at which you could bring it at 40 pounds pressure, you could bring 1260 gallons under 40 pounds pressure.

Q. What effect would that have upon the pressure?

A. Well, it would not increase the hydrostatic pressure—the pressure would be the same in both cases if it were standing still. You understand the supply essentially affects the pressure. The amount of water that you can draw or that the city can use at any time, depends upon the amount of water that can be brought by the conduit four miles into the standpipe. Now then: if you can bring twice that amount of water, you can keep up your pressure—
510 your pressure will be greater. Now I can illustrate that from this table in this way: It would have this effect: Approximately four feet, one main, you could use only 278 gallons per minute with 48 pounds pressure. Now if you were to use 630 gallons per minute it would reduce it down to 40 pounds pressure. You could still use that 630 gallons per minute—if you had two mains you could use 630 gallons and have 48 pounds pressure. The two mains, with that particular draught on it, would raise the pressure 8 pounds. I think that answers it: With a given consumption the pressure would be higher.

Q. My question is: How would the situation be changed if the water were pumped from this side of the river into the standpipe?

A. Into the standpipe itself?

Q. Yes?

A. The question of supply main would be done away with. That is, we would not have to figure on how much water could be brought by that supply main into the standpipe. We could figure that two million gallons of water could be pumped into the standpipe, by getting the water from a loose end—from an open end to the standpipe; and as long as you used only two million gallons a day, the standpipe could be kept approximately full. The loss of pressure would be due entirely to the mains leading from the standpipe out into the city—ramification of the pipes in the streets. If
511 *If* they were large pipes you would have good pressure. If they were small pipes, you would have bad pressure, if you wanted much water.

Q. What makes up pressure—what are the elements that make up pressure?

A. The elements that cause pressure at a hydrant or at a cock in use?

Q. Yes?

A. There is one element that makes pressure and one element that takes off pressure. The element that makes pressure is the height at which the water stands in the standpipe. That makes hydrostatic pressure. If you draw a certain number of gallons per minute by means of flow in the mains from the stand pipe to the point at which it is taken out, and the faster that flow is the more pressure head it takes to put the water through there. If you have got 50 pounds pressure in this standpipe, it takes 20 pounds of that pressure to put water through the mains to the point where you are going; and you have got left only 30 pounds pressure, as would be shown on the pressure gauge put at that point.

Q. Suppose water is being drawn from that opening, how does it affect the pressure?

A. It affects the pressure just in proportion to whatever the friction is in this pipe. When we speak of friction in pipes, it is the resistence to the flow of water; and it takes a certain amount of that head to do it. For instance: when you are running a water wheel—I can illustrate it with water power probably better so it can be
512 understood better. If you are running a water wheel and you have 50 feet of head on that water wheel. If the pipe is large enough to bring all that water without any material friction, you have the advantage of a fifty foot head in running that water wheel and you get the horse power accordingly. If you undertake to bring the water down to a large water wheel through a six inch pipe, you would not get as much water through a six inch pipe as would take to run the water wheel; and whatever you did get through the pipe would be lost by pressure in getting it there. The pressure that otherwise could have been converted into power, has already been converted into power that is necessary to put the water through the main; and acts as a minus quantity at the orifice or at the point of delivery. So if you were to take an open end of a four inch pipe a good long distance from the stand pipe, and attempt to draw 600 gallons per minute through it, that much water would not flow through it at all. The size of the pipe limits the amount of water that can go through it at all; and there are cases where 600 gallons a minute could not go through that pipe with 92 foot or 90 foot pressure—with 50 pounds pressure on the standpipe. It would not be sufficient to make that water go through a four inch pipe some distance off.

Q. Let's get down to the facts as they exist in this system: If the pressure at the standpipe is 50 pounds—What is the size of the main leading from the standpipe to the hydrant at the corner of
513 First Avenue and 5th Street?

A. There is a great long stretch of four inch pipe along there, as shown by the map (plate III Hall's report), in my report, which I made from information obtained from the company—from

the water works company at that time. There would be a long stretch of four inch pipe between the stand pipe and the point mentioned. I have a statement here that I would like to refer to on that calculation that I made at the time that would be probably concentrated into better form, giving the reason why the system of using four inch pipe has been entirely abandoned. Engineers do not use *as it* water mains any longer and the reason why they do not use it. Would you like for me to read that and explain it?

Q. I believe I will get you to read it and then explain it?

A. (Reading from report:) "The reason for this is apparent when we consider that in order to pass 300 gallons per minute through a four inch pipe a velocity of 7.65 feet per second is necessary, the friction of which will neutralize 5.58 feet of head for each 100 feet of pipe and that 600 gallons per minute requires a velocity of 15.72 feet per second and makes a friction that neutralizes 20.4 feet of head per 100 feet of pipe. If a smooth, straight 4 inch pipe 1648 feet long were attached to base of standpipe, and allowed to flow
514 from a free end, the discharge with a standpipe head of 92 feet would be 300 gallons per minute. In order for the discharge to be 600 gallons per minute the length of the pipe could not be greater than 450 feet. A hydrant at corner of Short and 9th Streets would have to contend with the friction on 1000 feet of four inch dead end pipe, in addition to some friction on other mains leading to it from standpipe. It could not possibly supply two streams of 300 gallons each per minute."

Q. What's the next clause?

A. (Reading from report:) "A hydrant at corner of Third Avenue and 8th Street could not supply two streams."

Q. Now explain?

A. In a system of water works, two things are generally aimed at. One is, when it comes to fire protection, fire pressure. First is to be able to get as much water as you need through any hydrant; and secondly: to get it with a pressure that will put out the fire—throw the water on top of the houses or buildings. Now of course if the mains are too small to get that water there, you not only lose your pressure, but you lose the chance of getting the water actually through there so that it could be taken up and pumped on the fire. If you wanted two fire streams taking 600 gallons per minute through a pipe 500 feet long and only four inches in diameter, leading from a stand pipe 92 feet—if the water stood 92 feet in it, you could not get 600 gallons if it were poured out in a basin, or if you
515 had a free end and a hole dug in the ground, or a reservoir or if you poured it into a pit or a well, it would not pour 600 gallons per minute. It would do it with a pipe 450 feet long, smooth, straight and clean pipe, no longer than that, it would yield enough to run two fire hydrants by pumping it into the hose pipe.

Q. After it ran that distance, at the hydrant end, would it have any pressure at all?

A. No, it would be like running into an open box or an open reservoir.

Q. How would that be affected by the pressure from Rose Hill, say

that stands 85 feet above Broad Street—Suppose the top of Rose Hill standpipe is 210 feet, how would the pressure from that affect this situation you speak of?

A. It would not do any good unless you had mains large enough to bring it there. If you had four inch mains it would not get there with as much pressure as it would from a nearer reservoir.

Q. How much of this system in 1893 consisted of four inch pipe and how much now, if you know how much, and how much 6 inch pipe; and what was the total length of the mains in Columbus?

A. 66,600 feet; and of this amount 55,000 feet was six inches and under, 24,500 of it being four inch pipe. That is according to a statement I made after a careful estimate.

516 Q. I will ask you how the situation would be changed if you had six inch pipe instead of four inch pipe?

A. It would be changed to the extent of the capacity of a six inch pipe over a four inch pipe.

Q. How much is that?

A. That would be in proportion to their squares: 6 x 6 36, and 4 x 4=16. It would be in proportion of 16 to 36—in other words: a little more than twice the capacity. A six inch pipe is a little more than twice the capacity of a four inch pipe.

Q. Instead of having a four inch pipe at the corner of Third Avenue and Ninth Street, you had a six inch pipe, how would that affect it?

A. You could never deliver over twice as much water.

Q. What would be the pressure at that point for one or two fire streams, actual effective pressure?

A. I don't know whether I have figured that out or not. If I can't recollect it without referring to it, I would have to take a little time to figure it out. I would rather have a little time to myself in making a calculation of that kind, because it requires very careful work in making a calculation like that. I remember I made some estimates of what could be done at different hydrants with the present mains—as they were at that time.

Q. Take the mains as they were in 1893, taking this point?

A. I think I have it here. Here's a statement on page 29 (referring to report), which will show what the conditions were at

517 that time with regard to fire service with the mains that actually existed.

Q. Please read and explain that?

A. On page 29. (Reading.) "In using steamers for fire pressure, the main question to be considered is the supply of water at the hydrants. In ordinary practice about 300 gallons per minute is required for a good fire stream. This is based on a discharge of 1⅛ inch nozzle, with sufficient pressure at the pump to overcome the friction of 100 feet 2½ inch hose and leave 90 pounds pressure at the nozzle. Two such streams should at least be used at any fire. If the fire has gotten under headway four such streams should be used. We can say then that a fire will take from 300 to 1,200 gallons per minute and in most cases will last less than an hour. It fre-

quently happens, however, that a fire will last for a much longer time. We will suppose a fire at the corner of Broad and 12th Streets. The hydrants there have the advantage of a ten inch main and of being within a short distance of the standpipe. Say the fire requires two streams taking an aggregate supply of 600 gallons per minute. Suppose when the fire begins the pressure is at 40 pounds, showing a domestic consumption of 632 gallons per minute, which added to the fire supply makes a total demand of 1,232 gallons per minute. The water in the standpipe has a depth of 92 feet, and it holds 2356 gallons for every foot of depth. During the first minute the conduit yields six hundred and thirty gallons and the stand pipe 600 gallons. The standpipe's surface will fall at the following
518 rate: 3 feet in 12 minutes; 6 feet in 26 minutes; 9 feet in 39 minutes; 18 feet in 90 minutes. At the end of 90 minutes from the beginning the conduit will be yielding 862 gallons and the standpipe 370 gallons per minute, while the pressure will be down to 32 pounds at the base of the standpipe and still falling."

Q. Suppose the fire, instead of being at the corner of Broad and 12th Streets, was at the corner of 9th St. and Short, under those conditions, what would be the pressure there?

A. You could not get water for two streams. That would be the condition there. You could not get water with any pressure at all for two streams, according to the way the pipe was at that time.

I go on to say if you should need four streams, which is not at all uncommon—very necessary to have plenty of water: Say you wanted four streams at that point—at this point, at the corner of Broad, at the most—at the best place in the city, closest to the stand pipe and on a ten inch main: (Reading from report) "If four streams are used, making with the domestic supply a total draught of 1832 gallons per minute, the stand pipe would fall 18 feet in 40 minutes; at the end of which time the pressure will be 32 pounds, the conduit will be bringing 852 gallons per minute into the city and the standpipe will be furnishing 970 gallons per minute and still falling at the rate of nearly 5 inches per minute.

519 If this draught of 1832 gallons per minute were continued, a point finally would be reached where the supply from the standpipe would become too small to make up the deficiency from the conduit. This point would be reached in three hours and 40 minutes from the time of beginning, at the end of which time the water in the standpipe would be only 9 feet and the pressure at its base only 3.9 pounds. From this instant it would be impossible to get the full supply of 1832 gallons, and the amount coming would constantly diminish until no water would come from the standpipe to assist the conduit. As the ultimate capacity of the conduit with the full head of 117 feet is only 1495 gallons per minute it would be unable to supply the full amount called for. This is an extreme case, of course and is given to show the limit of a domestic and fire supply, under the most favorable circumstances where the fire is close to the standpipe and has large mains to draw upon.

At a hydrant remotely situated and on a four inch main badly

connected with the general system, another difficulty arises, viz: the friction on the mains leading from the standpipe to the hydrant.

There are many locations in the city where water for two fire streams could not be supplied from a hydrant, even when there is 92 feet of water in the standpipe. The conditions entering into a hydrant discharge, when water comes from several directions in pipes that are variously connected, are too complex for calculation.

520 The velocities in the different pipes will be modified by so many causes that any attempt at an exact estimate of discharge will be useless."

I will add, however, that the estimates that are given, are intended to approximate the conditions that would exist as near as it is possible to make those calculations.

Q. Look at this map (handing witness map introduced in evidence by complainants): I call your attention to the location of the point called the Columbus Iron Works, where a fire occurred in 1902, April, on the corner of Short and Ninth Street, South of Dillingham: Suppose a fire of considerable magnitude were to break out at a point located on the map, Dillingham and 8th Street what amount of water would be available and what amount of pressure to fight that fire, whether it would be sufficient for the purpose, assuming further that the Rose Hill standpipe was at that time erected?

A. Well, in the case of the Rose Hill standpipe, you would either have to get the water from the Rose Hill standpipe or the other one. You could not get it from both of them at once, they being of different levels, that is, for the Rose Hill standpipe water to do any good. If you did it would run the other standpipe over.

Q. That is assuming the Rose Hill standpipe water was turned on and drawing from that standpipe?

A. With the system and mains as shown here?

The MASTER: And the fire between Dillingham and 8th Streets, West of Front?

WITNESS: And lasting how many hours, that is, what would be the extent of the fire, in other words?

521 Q. Suppose it lasted eight hours and resulted in a loss of $330,000 worth of property?

A. That's a new question that I would like to take into consideration and figure it out. I can do it quicker when I sit down and have time to think it over. It is a complex question. There are several mains coming to that point and I would not like to jump at a conclusion on it. I would like to have the indulgence of the court:

Mr. WIMBERLY: If the witness is going to do that, in order to get the benefit of it: I would like for the witness to make an estimate also on the basis of what it would be if the company had been notified to keep both of its pumps running to keep the Rose Hill Standpipe full, the pumps each having a capacity of 1000 gallons per minute and take of course the delivery according to the present system with the different connections, etc. that have been put in since he made his original map, pumping directly into the mains, so as to keep up that direct pressure there to supplement the original Rose

istence so as to have had a chance to have questioned him about it; and I shall object to it coming in.

Mr. MARTIN: I did not know council or the city had had it made. Didn't know anything about it until a day or two ago, Mayor Chappell sent me this. If we had known of it we certainly would have shown it to him.

(By Mr. WIMBISH:)

Q. I will get you to look at that analysis and state what you know regarding the character of water showing such an analysis as that?

(Handing witness paper.)

Objected to and objection overruled.

A. It would be very impure. The chemist says "The analytical shows that this water is loaded with organic matter in a state of putrefaction, and is therefore unfit for drinking purposes." That's the organic matter I had reference to.

Q. Is decayed vegetable matter organic or inorganic?

A. I believe that would be styled organic matter and the animal matter would be organized matter.

489 Q. Are you familiar with physical situation between the City Mills' dam and the dam of the Columbus Power Co.

A. The physical situation?

Q. Yes.

A. In a general way I know about the difference between the two.

Q. Do you know whether or not there is a continuous pond of water between those two dams, that is, does the City Mills' dam back water to the foot of the Columbus Power Company's dam?

A. I believe such a condition did exist a few years ago.

Q. Has it been changed at all: Do you remember the condition: Do you recall the litigation that was had?

A. I don't remember except reading it in the newspaper. My recollection is that they permitted it to continue. I don't know.

The MASTER: State what you know:

A. I don't know.

Q. I will ask you if you know the point where the surface drainage from Bibb City enters the river—approximately the point?

A. Yes, sir.

Q. Is that in the pond caused by the City Mills' dam?

A. I don't know whether it reaches there or not; but I am disposed to think it does. It is just below the rapids—below the Columbus Power Company's dam a few hundred yards. My recollection it is where the top of that water reaches, I won't be certain.

Q. Do you know the current of the river at that point,
490 whether it is on the Georgia side or the Alabama side?

A. I don't know. My idea is that it would go towards the Alabama side and comes and strikes an angle at the Georgia side and makes a turn. That's my general impression.

Q. If this sewerage is discharged into the pond caused by the dam of the City Mills' Company, what effect would it have as to contaminating the whole pond?

A. I think it would contaminate the whole of it.

Q. Do you know where a large part of the surface drainage from Rose Hill empties into the river—I refer to the drainage about 19th street?

A. Yes, sir.

Q. Is that above the City Mills' dam?

A. I think it is right above it—right close to it.

Q. What effect would the discharge from that drainage have?

A. In dammed up water it would have a considerable contaminating effect; but it would depend, of course, upon the current—how much current there was.

Q. You mean the current of the drainage itself?

A. Yes, as it strikes it; and also the current in the stream. If it was practically a pond it would circulate.

Q. What would be the effect of a rain fall—a large rain fall—heavy rain fall?

A. It would radiate in the pond, the surface washings: You mean the effect on the water?

Q. I mean the effect on the drainage and on the water shed itself as well as the pond itself into which it empties?

A. In case of rain storms the surface is supposed to be
491 washed off and any contaminated matter that might be on it is discharged into the larger streams. That's the way bodies of water become contaminated very largely.

Q. Mr. Wimberly asked you with reference to the health of this city: I will ask you whether that is due to the natural situation here, as to its natural surface drainage and its sandy soil?

A. I have always regarded the condition of the soil as one of the best elements we have, being conducive to good health—the sandy soil.

Question objected to as leading and objection sustained.

Q. To what is the good health of this city due, principally?

Mr. WIMBERLY: He has done answered it now and I don't insist upon his answering it again.

Q. Doctor, is the health record based upon the deaths only or sickness that don't result in death?

Mr. WIMBERLY: I object to that for the same reason that I did the other question. You are making suggestions.

Q. On what are the health records based?

A. Well, I should feel like asking you another question: You mean the deather rate? That's one way: we speak of a city's death rate per population, that is, the death rate irrespective of the general condition of the health; and then there is a health record which refers to the general health of the people—inhabitants.

Q. Now doctor, are there any records kept showing the health of various cities from diseases that do not result in death—any
492 authentic records?

A. I don't think there is any authentic records, no, sir.

Q. I will ask you how you judge of the general health of a com-

munity? How can you compare Columbus, Augusta, Atlanta, Nashville or Chattanooga unless you have the statistics to show?

A. In regard to the death rate, in my opinion, the only thing we have to go by, per population. But a man could find out these things in a general way by ascertaining whether they have a healthful section or not.

Q. How much does that depend upon inquiry in a community?

A. Depends a great deal.

Q. How much is it affected by local pride?

A. Very considerably.

Q. I will ask you whether diseases, such as low fevers, malaria and diseases of that kind, result in as large per centage of deaths as pneumonia, typhoid fever and those more acute diseases?

A. No, sir.

Q. Which are more common in a Southern latitude like this?

A. Malarial troubles, that class are more prevalent.

Q. Which are more directly due to an unwholesome water supply?

A. Malarial fever and the type of fevers that I referred to awhile ago as being unclassified.

(By Mr. WIMBERLY:)

Q. Do I understand you to say that vegetable matter is inorganic?

A. I believe I said that but upon reflection it is organic.

493 (Permission was here given witness to correct his answer previously given; and it appears in record as corrected—Stenographer.)

Q. The division is between mineral on one side and organic on the other?

A. Yes. I was going to ask later to allow me to correct that.

Q. Organic matter is anything that can decay, either vegetable matter or animal matter?

A. Can be separated into its component parts.

Q. It is the product of live growth subject to decay—death?

A. Yes, sir.

Q. Such as animals dying?

A. Yes.

Q. In technical or chemical language they putrefy or decay?

A. Yes.

Q. So that decayed, putrefied organic matter may be animal or vegetable?

A. Yes, sir.

Q. In speaking of health records, they not only show the number of deaths but show the cause of the death?

A. Yes, sir.

Q. You can tell whether it is a healthy community or not by the proportion of deaths in one as compared with the proportion of others?

A. In a general way you would, if you were—By way of illustra-

tion, if you see a representative physician of a place, you
494 would ask him as regards the health of the place. We have a great many of these little ailments or little spells of sickness that last a week with comparatively few deaths.

Q. Even with the same causes or types of causes that produce a great many little spells of sickness will produce certain fatalities?

A. That's right.

Q. Like malaria?

A. Yes, sir.

Q. Low fever sometimes kills?

A. Yes, sir.

Q. Malarial fever sometimes kills?

A. Yes. As I have said, low fever that is really not classified at all. Doctors, sometimes, when they are unable to call it typhoid or malarial fever, yet the patient has a little continued fever, week or ten days, they can't classify it.

Q. In other words: if you were to take the health reports from a large number of cities scattered over the country, those that are located in healthy localities, where the conditions are good and those that are located in unhealthy localities where the conditions are bad, you can see what diseases people die of and the proportion that die of certain diseases?

A. That is not absolutely true, for the reason that health resorts, for instance——

Q. Generally true?

A. In a general way they arrive at the conditions.

Q. Of course a health resort——

495 A. That must be taken into consideration. You would expect more deaths from malaria in the Mississippi Valley than you would——

Q. At a health resort you would have a man sick who would go there; but speaking about other localities, you could tell the amount of sickness at each by comparison?

A. In a general way.

Q. Even with lesser sickness, low fevers and things of that sort that do not kill, Columbus compares very favorably with sister cities?

A. In a general way.

496 TUESDAY MORNING, *March* 1, 1904.

Court met pursuant to recess and the hearing was resumed.

B. M. HALL, sworn by respondents, testified as follows:

(By Mr. WIMBISH:)

Q. Mr. Hall, what is your profession?

A. I am a hydraulic engineer, civil and mining engineer making a specialty of hydraulics.

Q. What has been your qualification for that profession?

A. Well, ever since the year 1880, I have been directly associated with the department of water supply and water power and the conveying of water in pipes, iron pipes and in every way that is necessary

to use, first in mining and afterwards in various ways. Ever since 1895 I have been the hydrographer for the United States Geological Survey, in the examination of water flowing in streams and making surveys and estimates for them; and I am now connected with the Reclamation Service in the west, irrigation schemes for the government in the west, as consulting engineer for the government.

Q. What was your college education?

A. I graduated at the Georgia University in 1876. I was elected to a professorship of mathematics at Dahlonega College, North Georgia Agricultural College, and was there four and one half years teaching mathematics and engineering.

Q. Are you a member of any society of civil engineers?

497 A. I am a member of the American Society of Civil Engineers and the American Institute of Mining Engineers.

Q. Are you acquainted with the plant of the Columbus Water Works Company?

A. Yes, I made an examination of it, not a very thorough examination of it, about ten years ago, and surveys and estimates; and I have seen it since frequently.

Q. Are you the B. M. Hall who made a report to the city of your investigations of this system in 1893?

A. I am.

Q. How did you find the system at that time with reference to reservoirs, where they were located, their character and capacity?

A. I found a storage reservoir and a clear water reservoir. The storage reservoir above what is intended for a clear water reservoir, both on Holland's Creek, about four miles from the city, at an elevation of something like 117 feet above Broad Street, the lower reservoir—top of the lower reservoir, which was the clear water basin. The storage in the storage reservoir was 39,000,000 and something—I have it exact—I can give the figures exact by referring to my notes. The capacity of the upper reservoir, which I call the storage reservoir, was 39,392,000 gallons, at that time; and the capacity of the clear water basin or lower reservoir, was supposed to be filled by drawing off the clear water from the upper reservoir into the lower reservoir, and was 12,078,000 gallons at that time.

498 Q. What was the length or dimensions of the upper reservoir?

A. The upper reservoir was—I have it here—I will have to count them up (witness figures). I estimated it at 2934 feet long—length of the reservoir as I have the figures here.

Mr. WIMBERLY: The upper?

WITNESS: 2934.

Q. Was it of marginal depths or thin edges?

A. In the construction of a reservoir for storing water, it is desirable and usual to make, where the water comes out along the hill slope where it is ponded up, instead of allowing it to run out on a thin, feather edge and run out to nothing, where it would be from a foot to one inch in depth, to have 8 or 10 feet along on the hill slope. Instead of doing that, it is usual to cut the bank down square and pile the dirt back, so as to make a square depth, so as not to be less

than four feet at the edge of the reservoir, where the water comes out to the hill side. It is usual to undertake to prevent any thin edges. The reason for that is this: if you get a sufficient depth of your water, it will not stagnate; because it won't get to the proper heat of stagnation, due to the temperature. The thickness of the water will prevent that. If it is four or five feet deep there, it will keep fresh, whereas, if it runs out to a thin edge, the depth of the water is so little, the sun shining down on it will heat the whole amount through to the bottom and will cause stagnation to set in in
499 the water; and that is the reason why it is generally specified that there should be no thin edges.

Q. What about the effect if the water recedes, gets down in the pond, leaving the bottom exposed?

A. It leaves, as it recedes, it leaves a large surface of material or a large surface of scum, where the water has occupied, and wet dirt and stagnation will set in and all that mud or selvage will cause objectionable qualities in the water—decomposition.

Q. Did you find any marginal depths in the upper reservoir, in 1893?

A. No, sir. In '93, there had been, so far as I could find, no place where there had been any attention paid to marginal depths. Simply just like building a mill pond—damming a mill pond and backing the water back and letting it take the natural slope of the hills, not only on the edges but on up the stream, no dam to prevent shallowness—a long stretch of shallow water. It is usual to cut that off in depths by excavation so there won't be any stretch of shallow water up the stream by backing it back, or quagmire among a lot of cat-tails and so on, as will happen by the filling in. At the upper edge of a pond, ordinary mill pond, you will frequently find that water will back off a long distance where it is only a foot deep, a very shallow basin; and that will grow up with vegetation, especially as the water is drawn down or the race fills up, it encourages the growth of vegetation; and it becomes simply a mud bottom with rank vegetation all over it; and the water will come up and occupy
500 that a little while and then it will go down again, owing to the draught that is on it. It is usual in constructing a storage reservoir to have a place where that will stop by putting a second dam up above and by cutting down and deepening it so it can't get shallow in places. And then this second dam serves as a means of turning away the flood water that brings down a large quantity of sediment and carries it around in a storm ditch. That is usual when a storage reservoir is made.

Q. You found that condition in this reservoir with respect to the growth of this vegetation, and the matter you speak of as growing, and that shallow water backed up the stream?

A. I found at the upper end of it large shallows; and there was more or less of that growth in it. I find by recent investigations that that has very largely increased and the water storage is largely diminished in the upper end owing to that fact. I made actual soundings and measurements in 1893, went on up the stream as far as there was back water that could be called storage. In 1903 I

ain made these soundings and I found that all that upper end
s been practically filled up with mud.

Q. How much in feet?

A. There would be 1100 or 1200 feet of it, in length, that has
en actually filled in, so that there was nothing but a creek running through—shallow creek running through.

91 Q. Is that filling in the result of the washings from the hill-sides and matter brought down the stream?

Q. Yes, the result of deposit brought down during floods down
e stream, and from the gullies, hill-sides and everything coming
. This material coming down the stream, slack water and stuff,
s filled up that upper end, where its actual widths, as I measured
, were 100, 160, 130 and 64. Those were the different widths
r 1200 feet to the upper end, beginning at the lower end, out
here it has filled up. There is a bridge across there, or was at the
me I made my measurements in 1893. From that bridge up prac-
cally everything is filled up. Whereas, at the bridge itself there
as 100 feet width of waterway there and had a depth, maximum
f five feet and an everage depth of 4 feet. Now it has about one
ot depth under that bridge.

Q. How did you find this reservoir with respect to storm ditches
r protection dams, were any there?

A. Absolutely no storm ditch. Nothing to carry the water
round. No way in the world for the water to go but to run right
nto it and carry all of its sediment into this pond. Now the pond
tself has the same relation to the clear water basin below, that an
dditional pond up above or an additional dam up above ought to
ave to it. Now there should be and should have always been a small
lam across the stream that would turn the water into a storm ditch,
at the time of a big flood, carry it around the whole system
502 and run it into the present storm ditch, so as not to let it go into the reservoir. There never has been anything of the
kind at the upper reservoir, instead of that, the water has come
down, bringing all the sediment and everything else it had in it
right into the storage reservoir.

Q. How did you find conditions in 1903, they changed in any
respect?

A. I found the conditions were the same. I found that the result
of those conditions has shown itself to a marked degree in that ten
years. The conditions existing at that time, the conditions of non-
protection—it was not in any condition where it could be protected
against material coming into it; and those same conditions now
exist; and the result of those conditions show very clearly on the
upper part of the upper reservoir.

Q. Is the upper reservoir a settling basin?

A. Yes, I should say it was. Water that would be allowed to
stand in it would settle to some extent; and it would be much more
so if it was larger—would be more of a settling basin. Where there
is a constant draught on a reservoir of course it does not have a
chance or time to settle as much as it would if there were not such
a draught.

Q. If the reservoir were larger and better protected, it would serve better as a settling basin?

A. Yes, would not have as much stuff in it to settle, if it was properly protected.

503 Q. Mud and material from muddy water would not come into it?

A. No.

Q. Did you find any method of filtration of this water—any plan adopted for its purification?

Q. No, sir; there was nothing in the form of a filter that could be called a filter. There was a screen there to keep logs and trash out—heavy large trash from getting into the mains. A screen for that purpose, as is usual in any system where water is going into pipes—absolutely necessary.

Q. I understand there is a screen but not a filter?

A. No filter.

Q. How was that in 1903?

A. The same, was a screen, no filter.

Q. What is the size of the main from the reservoir to the city?

A. One foot?

Q. Internal diameter?

A. Yes, one foot internal diameter. That is what it was when it was laid. How much it has grown up I don't know.

Q. What do you mean by that?

A. I mean any incrustation that naturally forms on the inside of the pipe.

Q. Are these cast iron pipes?

A. I think so.

Q. Does cast iron pipe permit of incrustation or deterio-
504 rations?

A. It does. There are exceptional cases where cast iron pipe will last for a great many years without incrustation, while the very next joint of pipe will incrust; and it has been found impossible to get the secret or to know why it will do that. Nobody has ever found it out yet. There is always more or less pipe in any main—more or less pipe that will incrust more than others. There is no uniformity in the chemical composition. While some joints of pipe will incrust quicker and form barnacles on the side, other joints will remain clean in the water, owing to the chemical conditions of the iron itself.

Q. What is the cause of incrustation?

A. It is a decomposition of the iron, forming oxide of iron, in connection with any sediment or mud—any solid material that is in the water; and it makes something that approximates iron ore or iron rust; and it will form barnacles or lumps on the inside and gradually closes up the pipes—makes the opening shaller.

Q. Suppose this incrustation takes place only at one or two points on a main four miles long, what would be the effect upon the capacity of the main and flow of water through it?

A. It would decrease the capacity at the point where it would form and offer great resistance to the water. It would make a very

material difference in the amount of water that would come through it.

505 Q. I will ask you if the capacity of the main is determined by the smallest part of it?

A. Yes, to this extent: Of course the water at that point where it is small is obliged to acquire a very large—very much greater velocity than it has at other places. It gets some benefit from the effect of the clean portions of the pipe. It is not exactly as bad as if the whole pipe was plugged up. It breaks up the current—breaks the continuity of the flow; and takes up a great deal of the energy of the head that is pushing it through. It really makes more difference than the main friction in the pipe does.

Q. Did you find the same main in 1903 that you saw in 1893?

A. Found one that looked exactly like it. Said it was the same main.

Q. You found no evidence to indicate but what it was the main originally laid?

A. Well, all I know about it is the first time I saw it was in 1893.

Q. Did it give evidence then of being a new main or an old main?

A. Looked like an old main.

Q. Have you any means of knowing what would be the probable incrustation in a main of that character in 20 years and the reduction of capacity, if any?

A. Just at present I have not. I could not approximate it except to say that it would be very material. I would have to take time to figure it out. That is a question, you understand, that 506 would relate to experiment and knowing the actual facts to exist. I would have to look up those facts. I have not looked that up to see what that would be.

Q. What would be the theoretic capacity of a 12 inch main if it were unobstructed?

A. A 12 inch main, four miles long, straight, smooth, unobstructed, with a head equal to the present head on this main, if it were to be discharged in an open basin right on the ground at the foot of a standpipe, or if the standpipe were taken away, I will take it on the ground there, that water will pour into that hole 1495 gallons per minute, is my estimate of what the greatest quantity of water that could be expected to flow from that main under the pressure it has.

Q. That would be a little over 2,000,000 gallons per day?

A. Yes, practically two million gallons.

Q. What effect on the capacity does flowing into the standpipe have?

A. If the stand pipe is 120 feet high it takes 120 feet of head to fill it. That standpipe is really higher than the reservoir; so I would have to figure on a lower basis. The water should stand in the stand pipe on a level with the water in the reservoir.

Q. Then there would be no delivery?

A. There would be no delivery; but there would be pressure—hydrostatic pressure shown on the gauge. If you were to draw the

water from there, you would reduce the pressure as your water comes.

507 The MASTER: You mean draw it from the pipe or from the main?

WITNESS: Well, draw on it from the main.

Q. That reduces the pressure?

A. Yes; it would draw—as you produced a flow of water in that pipe, it takes a certain amount of this head to make that flow. If you get a certain velocity in that pipe and it takes two pounds of pressure to make that velocity, then you have not got that two pounds. You have reduced it down to 48 pounds instead of fifty. I have a tabulated statement that will give you an idea of it, on page 28 of my report. If you had a pressure gauge at the foot of the stand pipe, and if the water in the whole system were at rest, no water being drawn from the mains, water would stand on a same level in the stand pipe with whatever it is in the reservoir that it is drawn from; and it would give a pressure of 50.70 pounds. That is, it would show that on the pressure gauge.

Q. If the stand pipe was full?

A. Yes, and no water being drawn. If there was a consumption in the city of 278 gallons per minute, that would bring the pressure down to 48—it would lower the standpipe—it would have to lower the standpipe in order to get any flow from the reservoir into the standpipe. It would take two pounds of pressure to do that, which would be something over 4 feet—between four and five feet of head.

508 It would lower the standpipe, so that there would be a flow from the reservoir to the standpipe; and the pressure would be 48 pounds at the base of the stand pipe. If you were to use 630 gallons per minute in the city, the stand pipe would continue to fall until it got to a point where it would stand and allow you to use 630 gallons per minute and stay at that point and the pressure would be 40 pounds at the base of the stand pipe. If you were to use 1495 gallons a minute the stand pipe would be emptied. The head would be utilized in pushing the water through and you would have no pressure. If you were to get it out of a basin, let it pour into a basin on a level with Broad Street, and pump it out into the mains, it would give you a flow of 1495 gallons per minute, provided you had a clean, straight, unobstructed pipe line, one foot in diameter, four miles long.

The MASTER: What is that in million gallons per day?

A. About two million gallons.

Q. So if I understand you, if the consumption in this city should be two million gallons a day, it would absorb all that the pipe could possibly deliver and leave no pressure?

A. Leave no pressure. Take every bit of it for the delivery of the pipe and would leave absolutely no pressure on it. It would be water delivered at the level of Broad Street and would then have to be pumped—taken up and pumped into the mains in order to get any pressure.

509 Q. Could that be remedied by pumping into the standpipe?

The MASTER: Let me ask you a question: What effect, if any, ould two mains have on that condition? You were about to get ff on the question of pumping; and I would like to have that as matter of information?

A. Lay a duplicate main?

The MASTER: Yes.

A. Of the same size as the one that is already in?

The MASTER: Yes, suppose you had two 12 inch mains?

A. Would double the amount of water that could be brought. Vould not have any—would not make any more water up there; ut would allow you to bring twice as much water as you would therwise.

Q. What effect would it have upon the pressure?

A. It would double the amount of water that could be brought nder a certain given head. For instance: instead of 630 gallons eing the limit at which you could bring it at 40 pounds pressure, ou could bring 1260 gallons under 40 pounds pressure.

Q. What effect would that have upon the pressure?

A. Well, it would not increase the hydrostatic pressure—the pressure would be the same in both cases if it were standing still. You understand the supply essentially affects the pressure. The amount of water that you can draw or that the city can use at any time, depends upon the amount of water that can be brought by the conduit four miles into the standpipe. Now then: if you can bring twice that amount of water, you can keep up your pressure—
510 your pressure will be greater. Now I can illustrate that from this table in this way: It would have this effect: Approximately four feet, one main, you could use only 278 gallons per minute with 48 pounds pressure. Now if you were to use 630 gallons per minute it would reduce it down to 40 pounds pressure. You could still use that 630 gallons per minute—if you had two mains you could use 630 gallons and have 48 pounds pressure. The two mains, with that particular draught on it, would raise the pressure 8 pounds. I think that answers it: With a given consumption the pressure would be higher.

Q. My question is: How would the situation be changed if the water were pumped from this side of the river into the standpipe?

A. Into the standpipe itself?

Q. Yes?

A. The question of supply main would be done away with. That is, we would not have to figure on how much water could be brought by that supply main into the standpipe. We could figure that two million gallons of water could be pumped into the standpipe, by getting the water from a loose end—from an open end to the standpipe; and as long as you used only two million gallons a day, the standpipe could be kept approximately full. The loss of pressure would be due entirely to the mains leading from the standpipe out into the city—ramification of the pipes in the streets. If
511 *If* they were large pipes you would have good pressure. If they were small pipes, you would have bad pressure, if you wanted much water.

Q. What makes up pressure—what are the elements that make up pressure?

A. The elements that cause pressure at a hydrant or at a cock in use?

Q. Yes?

A. There is one element that makes pressure and one element that takes off pressure. The element that makes pressure is the height at which the water stands in the standpipe. That makes hydrostatic pressure. If you draw a certain number of gallons per minute by means of flow in the mains from the stand pipe to the point at which it is taken out, and the faster that flow is the more pressure head it takes to put the water through there. If you have got 50 pounds pressure in this standpipe, it takes 20 pounds of that pressure to put water through the mains to the point where you are going; and you have got left only 30 pounds pressure, as would be shown on the pressure gauge put at that point.

Q. Suppose water is being drawn from that opening, how does it affect the pressure?

A. It affects the pressure just in proportion to whatever the friction is in this pipe. When we speak of friction in pipes, it is the resistence to the flow of water; and it takes a certain amount of that head to do it. For instance: when you are running a water wheel—I can illustrate it with water power probably better so it can be
512 understood better. If you are running a water wheel and you have 50 feet of head on that water wheel. If the pipe is large enough to bring all that water without any material friction, you have the advantage of a fifty foot head in running that water wheel and you get the horse power accordingly. If you undertake to bring the water down to a large water wheel through a six inch pipe, you would not get as much water through a six inch pipe as would take to run the water wheel; and whatever you did get through the pipe would be lost by pressure in getting it there. The pressure that otherwise could have been converted into power, has already been converted into power that is necessary to put the water through the main; and acts as a minus quantity at the orifice or at the point of delivery. So if you were to take an open end of a four inch pipe a good long distance from the stand pipe, and attempt to draw 600 gallons per minute through it, that much water would not flow through it at all. The size of the pipe limits the amount of water that can go through it at all; and there are cases where 600 gallons a minute could not go through that pipe with 92 foot or 90 foot pressure—with 50 pounds pressure on the standpipe. It would not be sufficient to make that water go through a four inch pipe some distance off.

Q. Let's get down to the facts as they exist in this system: If the pressure at the standpipe is 50 pounds—What is the size of the main leading from the standpipe to the hydrant at the corner of
513 First Avenue and 5th Street?

A. There is a great long stretch of four inch pipe along there, as shown by the map (plate III Hall's report), in my report, which I made from information obtained from the company—from

the water works company at that time. There would be a long stretch of four inch pipe between the stand pipe and the point mentioned. I have a statement here that I would like to refer to on that calculation that I made at the time that would be probably concentrated into better form; giving the reason why the system of using four inch pipe has been entirely abandoned. Engineers do not use *as it* water mains any longer and the reason why they do not use it. Would you like for me to read that and explain it?

Q. I believe I will get you to read it and then explain it?

A. (Reading from report:) "The reason for this is apparent when we consider that in order to pass 300 gallons per minute through a four inch pipe a velocity of 7.65 feet per second is necessary, the friction of which will neutralize 5.58 feet of head for each 100 feet of pipe and that 600 gallons per minute requires a velocity of 15.72 feet per second and makes a friction that neutralizes 20.4 feet of head per 100 feet of pipe. If a smooth, straight 4 inch pipe 1648 feet long were attached to base of standpipe, and allowed to flow
514 from a free end, the discharge with a standpipe head of 92 feet would be 300 gallons per minute. In order for the discharge to be 600 gallons per minute the length of the pipe could not be greater than 450 feet. A hydrant at corner of Short and 9th Streets would have to contend with the friction on 1000 feet of four inch dead end pipe, in addition to some friction on other mains leading to it from standpipe. It could not possibly supply two streams of 300 gallons each per minute."

Q. What's the next clause?

A. (Reading from report:) "A hydrant at corner of Third Avenue and 8th Street could not supply two streams."

Q. Now explain?

A. In a system of water works, two things are generally aimed at. One is, when it comes to fire protection, fire pressure. First is to be able to get as much water as you need through any hydrant; and secondly: to get it with a pressure that will put out the fire—throw the water on top of the houses or buildings. Now of course if the mains are too small to get that water there, you not only lose your pressure, but you lose the chance of getting the water actually through there so that it could be taken up and pumped on the fire. If you wanted two fire streams taking 600 gallons per minute through a pipe 500 feet long and only four inches in diameter, leading from a stand pipe 92 feet—if the water stood 92 feet in it, you could not get 600 gallons if it were poured out in a basin, or if you
515 had a free end and a hole dug in the ground, or a reservoir or if you poured it into a pit or a well, it would not pour 600 gallons per minute. It would do it with a pipe 450 feet long, smooth, straight and clean pipe, no longer than that, it would yield enough to run two fire hydrants by pumping it into the hose pipe.

Q. After it ran that distance, at the hydrant end, would it have any pressure at all?

A. No, it would be like running into an open box or an open reservoir.

Q. How would that be affected by the pressure from Rose Hill, say

that stands 85 feet above Broad Street—Suppose the top of Rose Hill standpipe is 210 feet, how would the pressure from that affect this situation you speak of?

A. It would not do any good unless you had mains large enough to bring it there. If you had four inch mains it would not get there with as much pressure as it would from a nearer reservoir.

Q. How much of this system in 1893 consisted of four inch pipe and how much now, if you know how much, and how much 6 inch pipe; and what was the total length of the mains in Columbus?

A. 66,600 feet; and of this amount 55,000 feet was six inches and under, 24,500 of it being four inch pipe. That is according to a statement I made after a careful estimate.

516 Q. I will ask you how the situation would be changed if you had six inch pipe instead of four inch pipe?

A. It would be changed to the extent of the capacity of a six inch pipe over a four inch pipe.

Q. How much is that?

A. That would be in proportion to their squares: 6 x 6 36, and 4 x 4=16. It would be in proportion of 16 to 36—in other words: a little more than twice the capacity. A six inch pipe is a little more than twice the capacity of a four inch pipe.

Q. Instead of having a four inch pipe at the corner of Third Avenue and Ninth Street, you had a six inch pipe, how would that affect it?

A. You could never deliver over twice as much water.

Q. What would be the pressure at that point for one or two fire streams, actual effective pressure?

A. I don't know whether I have figured that out or not. If I can't recollect it without referring to it, I would have to take a little time to figure it out. I would rather have a little time to myself in making a calculation of that kind, because it requires very careful work in making a calculation like that. I remember I made some estimates of what could be done at different hydrants with the present mains—as they were at that time.

Q. Take the mains as they were in 1893, taking this point?

A. I think I have it here. Here's a statement on page 29 (referring to report), which will show what the conditions were at

517 that time with regard to fire service with the mains that actually existed.

Q. Please read and explain that?

A. On page 29. (Reading.) "In using steamers for fire pressure, the main question to be considered is the supply of water at the hydrants. In ordinary practice about 300 gallons per minute is required for a good fire stream. This is based on a discharge of 1⅛ inch nozzle, with sufficient pressure at the pump to overcome the friction of 100 feet 2½ inch hose and leave 90 pounds pressure at the nozzle. Two such streams should at least be used at any fire. If the fire has gotten under headway four such streams should be used. We can say then that a fire will take from 300 to 1,200 gallons per minute and in most cases will last less than an hour. It fre-

quently happens, however, that a fire will last for a much longer time. We will suppose a fire at the corner of Broad and 12th Streets. The hydrants there have the advantage of a ten inch main and of being within a short distance of the standpipe. Say the fire requires two streams taking an aggregate supply of 600 gallons per minute. Suppose when the fire begins the pressure is at 40 pounds, showing a domestic consumption of 632 gallons per minute, which added to the fire supply makes a total demand of 1,232 gallons per minute. The water in the standpipe has a depth of 92 feet, and it holds 2356 gallons for every foot of depth. During the first minute the conduit yields six hundred and thirty gallons and the stand pipe 600 gallons. The standpipe's surface will fall at the following
518 rate: 3 feet in 12 minutes; 6 feet in 26 minutes; 9 feet in 39 minutes; 18 feet in 90 minutes. At the end of 90 minutes from the beginning the conduit will be yielding 862 gallons and the standpipe 370 gallons per minute, while the pressure will be down to 32 pounds at the base of the standpipe and still falling."

Q. Suppose the fire, instead of being at the corner of Broad and 12th Streets, was at the corner of 9th St. and Short, under those conditions, what would be the pressure there?

A. You could not get water for two streams. That would be the condition there. You could not get water with any pressure at all for two streams, according to the way the pipe was at that time.

I go on to say if you should need four streams, which is not at all uncommon—very necessary to have plenty of water: Say you wanted four streams at that point—at this point, at the corner of Broad, at the most—at the best place in the city, closest to the stand pipe and on a ten inch main: (Reading from report) "If four streams are used, making with the domestic supply a total draught of 1832 gallons per minute, the stand pipe would fall 18 feet in 40 minutes; at the end of which time the pressure will be 32 pounds, the conduit will be bringing 852 gallons per minute into the city and the standpipe will be furnishing 970 gallons per minute and still falling at the rate of nearly 5 inches per minute.

519 If this draught of 1832 gallons per minute were continued, a point finally would be reached where the supply from the standpipe would become too small to make up the deficiency from the conduit. This point would be reached in three hours and 40 minutes from the time of beginning, at the end of which time the water in the standpipe would be only 9 feet and the pressure at its base only 3.9 pounds. From this instant it would be impossible to get the full supply of 1832 gallons, and the amount coming would constantly diminish until no water would come from the standpipe to assist the conduit. As the ultimate capacity of the conduit with the full head of 117 feet is only 1495 gallons per minute it would be unable to supply the full amount called for. This is an extreme case, of course and is given to show the limit of a domestic and fire supply, under the most favorable circumstances where the fire is close to the standpipe and has large mains to draw upon.

At a hydrant remotely situated and on a four inch main badly

connected with the general system, another difficulty arises, viz: the friction on the mains leading from the standpipe to the hydrant.

There are many locations in the city where water for two fire streams could not be supplied from a hydrant, even when there is 92 feet of water in the standpipe. The conditions entering into a hydrant discharge, when water comes from several directions in pipes that are variously connected, are too complex for calculation.

520 The velocities in the different pipes will be modified by so many causes that any attempt at an exact estimate of discharge will be useless."

I will add, however, that the estimates that are given, are intended to approximate the conditions that would exist as near as it is possible to make those calculations.

Q. Look at this map (handing witness map introduced in evidence by complainants): I call your attention to the location of the point called the Columbus Iron Works, where a fire occurred in 1902, April, on the corner of Short and Ninth Street, South of Dillingham: Suppose a fire of considerable magnitude were to break out at a point located on the map, Dillingham and 8th Street what amount of water would be available and what amount of pressure to fight that fire, whether it would be sufficient for the purpose, assuming further that the Rose Hill standpipe was at that time erected?

A. Well, in the case of the Rose Hill standpipe, you would either have to get the water from the Rose Hill standpipe or the other one. You could not get it from both of them at once, they being of different levels, that is, for the Rose Hill standpipe water to do any good. If you did it would run the other standpipe over.

Q. That is assuming the Rose Hill standpipe water was turned on and drawing from that standpipe?

A. With the system and mains as shown here?

The MASTER: And the fire between Dillingham and 8th Streets, West of Front?

WITNESS: And lasting how many hours, that is, what would be the extent of the fire, in other words?

521 Q. Suppose it lasted eight hours and resulted in a loss of $330,000 worth of property?

A. That's a new question that I would like to take into consideration and figure it out. I can do it quicker when I sit down and have time to think it over. It is a complex question. There are several mains coming to that point and I would not like to jump at a conclusion on it. I would like to have the indulgence of the court:

Mr. WIMBERLY: If the witness is going to do that, in order to get the benefit of it: I would like for the witness to make an estimate also on the basis of what it would be if the company had been notified to keep both of its pumps running to keep the Rose Hill Standpipe full, the pumps each having a capacity of 1000 gallons per minute and take of course the delivery according to the present system with the different connections, etc. that have been put in since he made his original map, pumping directly into the mains, so as to keep up that direct pressure there to supplement the original Ros

Hill pressure and supply it after the Rose Hill pressure had begun to fail.

Q. Mr. Hall, I wish you would look at the map you have in your hand and state what additions or improvements have been made since 1893, if you can do so without too great delay?

A. Well, the biggest improvement that I see is the erection of the Rose Hill standpipe and the mains that exist in that vicinity.
522 At the time I made the examination in '93, it was confined to the lower part of the city and there were few mains up as high as 18—18th or 19th Streets. There was a few mains up that high at that time but not the Rose Hill supply.

Q. Have there been any substantial additions or changes to the system down town as to either the sizes of the pipes or extensions?

A. I find the same main down Broad Street. Don't see any difference. Goes one block of 12 inch main and three blocks of ten inch main and three blocks of 8 inch and two blocks of six inch, in the old system. In this new system: one block of 12 inch, three blocks of ten inch, two blocks of eight inch and four blocks of six inch. That would appear from this map that I either had one block too many of eight inch pipe, or else in this system they have one block too short. On that they don't correspond. They correspond everywhere else except in this respect. One block shown on the last as six inch that is shown as eight inch on my system in 1893. I took my information from Mr. Tuggle, of the water works company.

Q. Who was Mr. Tuggle?

A. Mr. Tuggle was superintendent—an official of the company. I think he was superintendent.

Q. I will ask you to look to that map as to where the four inch mains are and say how they compare?

A. Taking the next street, that is, First Avenue, which is next to Broad. On First Avenue, the present system has five blocks of four inch mains and a missing block with no main on it. The old
523 system had only four blocks of four inch main and a missing block, and probably a four inch there (referring to map). Approximately the same, if that's a four inch—it is hardly legible—the presumption is it is a four inch. They would not have taken out a six inch pipe and put in a four inch. Might have taken out a four inch and put in a six inch. Looks like a six or a four. Intended as a four. It is a four on this last one. If it is a four it is identical, so far as that is concerned.

Q. Taking the map that you have, do you see any substantial extensions or improvements?

A. I don't see any place where a four inch has been taken out. On Sixth Street I see a line of six inch pipe there (referring to map). Along in here. Does not state whether it was a four or six. Must have been a six. On Sixth Street from Broad Street over to about 7th Avenue. The new map you have shows it to be six inch pipe. On my map it shows a pipe in there without showing whether it was a six or four. I presume I had it in my summary of the amount of pipe, which was also taken directly from their statement, not from

my map. Didn't take it from my map. I made my map out according to what information I could get from the company; and then I made out that list or amount of pipe from their statement submitted to me as the facts of the case. That particular line must have been at that time a six inch pipe, probably was—it is here. It may have been a four inch. If it was, it has been replaced by a six. I don't see any material change. That is positive enough. There may be additions that I have not found.

524 Q. I don't mean slight, I mean substantial additions or changes?

A. On Tenth Street the six inch pipe has been run two blocks further out than it was before, going east. Sixth Avenue has had an addition to it. From the corner of Tenth and Sixth Avenue down, there are four blocks of six inch pipe. The four is an addition. These two blocks were in before and then it comes to four inch pipe. (Referring to map).

Mr. WIMBERLY: There are now how many?

A. Four more blocks. The addition is that there are four blocks of six inch pipe that was not there. There is also four inch pipe that has been added to the system at the upper end of the system. There is a block and a half of four inch pipe that was not there at that time—that's Fifth Avenue I am talking about now. I got on the wrong Avenue accidentally. I will go back and correct that statement. I was looking at Sixth Avenue. Beginning with 12th Street and going down town—I got switched off to that street, so close together. There are six blocks of six inch pipe that was not there at that time. I don't see any other changes. I have already stated that but stated it in reference to the wrong street. On Fifth Avenue, there was a vacancy at that time of four blocks and there is still a vacancy of four blocks. This is 5th Avenue here; and it shows that there was a vacancy of four blocks there and that vacancy is there now.

Q. In '93?

525 A. Yes. On Fourth Avenue six inch pipe has been laid on one block there and tied together that was not along there —was a vacancy at that time. Six inch pipe has come in on one block. No change on 5th; and one block on 4th and six blocks on Sixth Avenue of six inch pipe.

Q. Is the system as you found it in '93 and as changed up to the present time, such a system as is sufficient to furnish an adequate water supply to this city for domestic and fire purposes, if not, why not?

A. It is not according to my opinion.

Q. Please state in detail why it is not and your opinion on the various points?

A. In the first place the large pipe are not large enough. The medium sized pipe are not large enough. The four inch pipe ought to be out altogether as the system exists. In laying a system of mains, you lay your mains for fire service; and when you get a fire service you will want a domestic service—the domestic service comes in as a natural consequence; and takes up very little of the fire protection, almost nothing in a properly laid system of mains. If you

have a system of pipes that are adequate for fire service, you don't need a duplicate or another system laid for domestic service. Therefore, if you put in a system that is adequate, giving large enough pipe for the mains and tying them together often enough, doing away with dead ends, why you would have no use for a smaller system running parallel.

526 Q. What about the source of supply, the pipe leading from the reservoir to the city, its size?

A. It never has been sufficient since I have known it to furnish domestic or fire service to this city, under any reasonable conditions, both in pressure and quantity.

Q. Is it capable of extension, changes or enlargements so as to adapt it to proper service, without practical re-construction?

A. I think not. I don't think it would be good policy to attempt to use it as a part of the system, a pipe only 12 inches in diameter. Don't think it would be economy to do it. It is an old one also.

Q. Now speaking of the whole system?

A. I don't think it would be economy to use the whole system, considering the mains and so on. They are all too small for the purpose. Some of the pipe could be taken up and laid at other places. As it exists now the largest size pipe are put at points demanding the largest pipe but they are not large enough.

Q. At that point?

A. At that point. They would be large enough for some points, provided the pipe was good and clean—good as new—large enough for some other points.

Q. Taking into consideration the age of the pipe, which we will admit to be 20 years, and the plan of the system and the system as it is actually constructed, I will ask you if you could practically change the system as to make it adequate or would it be necessary to practically re-construct the system or build a new one?

527 A. I think it would be best economy to buy new pipe and put it in, making a larger and complete system independent of anything that is in it. I don't think reconstructing the old system and the necessary changes that would be in order to use part of the material would be for the best, having to take it up and put it down again and making the necessary connections and everything of that kind. I think that it would be cheaper to buy new pipe and dig new trenches and put them in it.

Q. Would that still be true, be necessary to re-construct the system without regard to the source of supply?

A. If you had plenty of water?

Q. Yes?

A. If you had plenty of water, yes, that would be true. Other cities have plenty of water and unlimited pressure because they pump direct—steam pumps and have larger mains and better distributed maines necessary in order to meet the needs.

Q. How are the mains distributed in this city, properly or improperly, the distribution system?

A. Improperly. A system in the heart of a city, such as this is where it is built up so, ought to have water mains on every street.

ought to be large mains, nothing less than six inches anywhere, and all ought to be connected up. Ought not to be any missing places or missing blocks or streets on which there are no water mains.

528 Q. What effect does dead ends have upon the system?

A. The water has to come in from one way and it limits the supply. If you have a hydrant with two mains coming to the hydrant, one from one way and one from another, you have it to draw on from both mains. You should have the system connected up so that you can get the water from both ways. You draw one half of the water through this pipe and one half the amount through the other pipe; and you won't have as much friction in it and you get more water for the same pressure. Now if you have a dead end or a hydrant on the end of a pipe, and the water coming from only one way so you had to depend solely upon that one pipe, a water tap on that pipe has to draw water from that one pipe, the houses and hydrant and so on has to draw water from that one pipe; and if you make a heavy draught on it, you reach the limit of that pipe's capacity and you can't go beyond that. A dead end also has its effect on the quality of the water. Long intervals where there is not enough draught on it to keep the water in circulation, causes the water to stand and stagnate and makes bad water in a dead end, which is very undesirable. If it is connected up, some water will be flowing through it all the time. A hydrant a quarter of a mile away will be drawing water past that hydrant or point of connection.

Q. What is the effect upon the pipe with reference to its impregnation with impurities from muddy, impure, or foul water flowing into it, especially at or near dead ends?

529 Q. What effect would that have upon the pipe itself?

Q. As to impregnating it with impurities?

A. If there are specific germs in the water, say typhoid fever germs or any contagious germs—disease germs, they would get in the slime on the inside of the pipe and remain there a long time; and it would be very hard to get them out, even if you get clean water into it.

Q. In the dead ends?

A. From the fact that they have got a lodgement—a place to lodge in the slime and mud in the pipe.

Q. Going to the source of supply now: Would it have been feasible to have filtered the water from Holland's Creek from the reservoir?

A. Ten years ago?

Q. Yes?

A. Yes. Atlanta was filtering her water at that time very successfully.

Q. How was it in '91?

A. I will have to trust to memory as to the date: My recollection is that Atlanta was filtering her water at that time. I examined the filters—I think I examined the filters at that time, the Hyatt System of filters, which is practically or approximately the same principle that *were* generally in use. How long filters had been successfully used before then I don't know. It was not anything very

new at that time. The system of mechanical filtering, the use of alum as a coagulant was then in use successfully, my recollection is.

530 Q. You mean the use of alum, together with the mechanical and sand process?

A. Yes. The alum is used simply as a coagulant.

Q. Suppose they had constructed in the reservoir a piece of masonry, consisting of two circular concentric walls——

Q. You mean a filter or reservoir?

Q. Yes, a filter, consisting of two concentric walls, arranged in annular positions, about 12 feet distant from each other, and having an internal diameter from the inner wall of from 40 to 50 feet, the outer having about 24 feet greater diameter. These walls to form a structure for containing between them, gravel, sand and filtering materials, through which all water supplied to the water main shall pass before being distributed to the city?

A. If that had been carried out it would have improved conditions there, I think. When I say carried out, I mean as to construction and operation. Filtration through 12 feet of sand and gravel would have had a very marked effect upon it.

Q. Suppose two reservoirs had been constructed of a capacity of 125,000,000 gallons, and the upper reservoir should have had marginal depths of not less than four feet, what effect would that have had both upon the supply and the quality of the water furnished the city?

A. Well, I am satisfied that it would have had the effect to have bridged over times of the worse droughts. I feel in a general
531 way it would have bridged over times of extreme drought—of low water.

Q. In other words, a storage reservoir of that capacity would not have suffered for the lack of water at those droughts?

A. That's my opinion, would not. Plenty of water in the stream. No trouble about the amount of water that comes down that stream, if you take flood water and all, if you have a reservoir large enough to catch it when it comes. If your reservoir lets it run over and down the stream, then you lose it and all you have to rely on then is the low water flow, which is very limited in a stream of that size. You can get a good supply of water from a stream anything like that size from a rain storm; and it is only a question of storing the water and holding it back when it comes when there is flush water.

Q. If they had done that, as I understand, they would have had plenty of water for all reasonable purposes?

A. I think during ten years past or during that time I made my examination, during any time, if they had had a reservoir of 125,000,000 gallons storage, they would have successfully past over these seasons of drought, if they had had the storage reservoir deepened and the edges so as not to form stagnant water and bad conditions.

Q. If they had had these marginal depths and proper protection by storm ditches and attempted also to have filtered the water, according to the best process then known, what in your opinion
532 would have been the quality of the water?

A. You mean the best process then known?

Q. Yes?

A. The best process that was used or practiced to have improved it, as time went on?

Q. Yes?

A. Why, there would have been a very marked improvement. They could have come to the system of mechanical filtration—slow filtration and could have got plenty of gravity—plenty of gravity head to do it. They could have had a system of storage, if they had had a pipe big enough to bring it and they could have had more pressure.

Q. Well now if these precautions had been taken by them as to supply and quality of water, would the water have become so impure and so foul as to be unfit, not only for domestic use but for bathing purposes?

A. It would not. I think I can answer most emphatically it would not, if those precautions had been taken.

Q. Notwithstanding as severe drought as they had in 1902?

A. I think it would have passed over that drought. Of course that is a matter of opinion. That is my opinion. I think it would have passed over that drought successfully.

Q. How was the drought of 1902 as compared with droughts in previous years?

A. I don't remember offhand. It is local—these conditions
533 are purely local. In other words: what would be true of one water shed or of one particular vicinity, might not have been true of the whole country. For instance: the lowest water that we have ever had within my knowledge, in a general way on the streams all over the State or all over the South, was in '96 and '97; and it is my recollection that this particular basin—Holl-d Creek basin, held out better during those seasons than it had some previous seasons and some seasons since. That was simply a matter of general knowledge—general hearsay; because I was not on the streams at those times. I never heard the complaints during '96 and '97 that I did at other seasons, showing that local conditions affect it. It is a small local water shed, subject to local rains, and so on.

Q. That would be represented fairly by the rain fall in the City of Columbus?

A. I think so. I think the rain-fall in the City of Columbus would represent it.

Q. It was a part of your duty, as a government official, to take the gauge of running streams, wasn't it?

A. Has been from 1895 up to the present time; but not at that time. I was not connected with the government service at that time.

Q. Do you know whether any statistics of the rain fall was kept for this city?

A. I found the rain fall had been kept and I made a statement of that in this report of the rain fall, if I could get hold of it, that

had been kept by the Weather Bureau—United States
534 Weather Bureau, Agricultural Department. I think by reference to that I could find it.

Mr. WIMBERLY: I think in a matter of this sort that we ought to have the official records.

Mr. WIMBISH: I am going to get that. I really did not intend to go into this evidence now.

Q. Mr. Hall, when you were here in '93, did you make a careful estimate of the value of the Columbus Water Works System, what it would cost to re-produce it?

A. Yes, sir; I did.

Q. Please state what that was; and give the items as you gave them?

A. I made a careful estimate of what it would take, the cost of the pipe and the cost of laying the pipe, and everything else that I could take into account; and I made what I believe to be a correct estimate. Two reservoirs—do you want a detailed statement?

Q. Yes?

A.—

Two reservoirs	$18,000
20,000 ft. 12 inch pipe at $1.05 laid	21,000
Stand pipe	10,000
3,700 ft. 10 inch pipe at 85 cents laid	3,145
7,900 ft. 8 inch pipe at 65 cents laid	5,135
30,500 feet 6 inch pipe at 51 cents laid	15,555
24,500 ft. 4 inch pipe at 36 cents laid	9,920
Specials for above mains	355
1,800 ft. of 12 inch extension at $1.05	1,890
	$85,000
535 Allowance for 18 inch pipe across the river, service pipe, meters, land for reservoirs, etc. and for contingencies	35,000
Total	$120,000

Q. Now suppose since that time the Rose Hill standpipe has been built at a cost of $5700. and 30,000 feet of six inch mains laid at $17.50 a ton?

A. Stand pipe on Rose Hill $5700?

Q. Yes?

A. And how much six inch pipe?

Q. 30,000 feet at $17.90 a ton, that is exclusive of the laying of the pipe?

A. I have somewhere in my statement—in my papers a statement of the price of pipe at the time I made this estimate. I don't remember exactly the comparison between the prices of pipe at that time and the price at this time.

Q. In '93 it was approximately as high as it is now, wasn't it?

A. That's my recollection. I would have to refer to my books—

look carefully through my old work to find it. I think, however that I have it stated in this publication, the price at which I figured, if I can find it.

Q. Suppose since that time a standpipe has been erected at a cost of $5700. and there had been laid 30,000 feet of six inch mains, what could that system be now re-produced for?

Objected to as illegal, immaterial and incompetent and that there are no facts in the evidence upon which such a hypothetical
536 question could be based.

(Question withdrawn by Mr. Wimbish.)

WITNESS: I find in my report, page 47 a table of the estimated cost of cast iron mains in Columbus, Ga. per foot of length.

Q. At the prices you estimated?

A. That is the cost of pipe laid in place. Now what I want to find is the cost per ton (first column). I find that six inch pipe is estimated at $22.20 a ton.

Q. Six inch and eight inch at the same price?

A. Yes. That will give a proper basis for calculating the items when they come up. I was very careful in my estimates at that time in what it would cost to dig the trenches, lay the pipe and fill them—all complete—for the work, so that I could find how much I allowed for the cost of the pipe itself per foot and the cost per foot for trenching, which will save my making this calculation over again. I made a very careful estimate at that time and made it from actual work that was done.

Q. You refer to the table on page 47?

A. Yes, sir.

Q. I will ask you if what you hold in your hand is the report you made in 1893?

A. Yes, sir.

Q. Does it actually state the facts as you found them?

A. It represents them. I have not found any mistakes in it that would be different from the facts as I found to be the facts. There is only one thing different in it at all, and that is a typo-
537 graphical error in plate III, some seven inch pipe put in there. If you will look at plate III, which is next to page 24, you will find it. The system of mains there you will see on Second Avenue between 12th—between 10th and 14th—between 11th and 14th Streets, there is some 7 inch pipe put in there. That was evidently a mistake. That should have been a four. Then on Second Avenue in this old map, from 11th Street—between 12th and 15th on Second Avenue, there are according to the new map, three blocks of four inch pipe and one block of six inch pipe——

Q. Which is six inch? (Referring to map.)

A. Down towards the lower end, next to 11th—I say between 12th and 15th, between 11th and 15th.

Q. 15th or 14th?

A. 15th. Between 12th and 15th there are three blocks of four inch pipe and between 11th and 12th there is one block of six inch pipe, on this new map. Now according to the old map, on that

same Avenue, between 12th and 11th, there is one block of something that is uncertain. Looks like a four. Between 11th and 15th there are three blocks of seven inch pipe, which would have been a four probably by drawing a horizontal mark on that seven.

Q. Should have been four?

A. Yes, sir.

538 Cross-examination.

(By Mr. WIMBERLY:)

Q. Please look on page 47 (of Hall's report), now, in the column of cost?

A. Cost per ton?

Q. Yes, in the second column: The estimate you made of the cost of re-producing the system as it then stood, was based on the cost per ton of iron pipe at Columbus, at the figures shown in column two, in the table on page 47, namely: $22.70 for the four inch, six and eight inch at $22.20, and 10, 12, 14, and 16, $21.70. The 14 and 16 go beyond the immediate system—present system?

A. Yes, sir.

Q. Do you know the present price of cast iron pipe laid down in Columbus: Have you looked that up?

A. I have not looked it up. I thought I could look it up when I came yesterday; but I did not get here until last night.

Q. If the estimates of other witnesses are correct, that is where they are laid down in Columbus, upon an average shows it to be about $33 per ton, then there would approximately be an addition of fifty per cent. to the cost of the pipe?

A. In the pipe at present?

Q. According to the estimate you made at that time?

A. I expect not. I don't know. I don't think there would be much difference in the cost in the laying of it; but the first cost of the pipe there would be, yes.

Q. Do you know how the price of labor in Columbus now compares with what it was in '93? Have you looked into that
539 since you have been here: You have to go by what the people here say about that?

A. I think I would have to go by the present labor conditions; though my recollection is that I made a liberal allowance in that labor account; that I didn't put it down on a very close, low basis; because I knew at *at* that time that labor would cost more than you would expect to get it on a farm, anything of that kind.

Q. The quantity of labor done and labor itself is a fluctuating element?

A. Yes; but I put that on such a basis as was usually found in city work. My recollection is that I took it from actual work that the city of Atlanta was doing at that time

Q. You took it on a basis of what labor was costing in Atlanta?

A. Yes, because it was close by me there and I could see what was being done and knew pretty well what it was costing.

Q. You spoke of the cost of lead: You made one item of that. Lead is what makes the joint connections?

A. Yes, the lead is poured into the joint in order to make it water tight.

Q. Lead is also more expensive now?

A. I have not looked into the present prices of lead. That I expected to do, as I say, when I got here.

Q. All building materials and structural materials at this time, on account of the very active condition of improvements within the last few years are considerably higher?

A. They have been but they are going down very rapidly.

540 I know in a good many items they are going down so rapidly that people would not make purchases on account of it.

Q. The same approximate proportion difference in the cost of iron pipe is true also with the cost of tees, crosses and iron fixtures of different sorts?

A. Yes, it would probably be a level change—would be uniform.

Q. I believe you stated that you made this very elaborate report of some 51 pages—printed pages, besides the index, to the City of Columbus, as to the entire conditions of the system after a most thorough examination?

A. Yes, after a very careful and thorough investigation with an inventory to get at the exact facts.

Q. You not only took into consideration the exact facts as to what then existed; but they also wanted to know from you what a system would cost to supply the present and future needs, including a large annexed territory that had been annexed since this contract was made: That's true?

A. Yes, sir.

Q. On the question of the quantity of the water as it then existed, you made this report on page 23?

A. Yes, sir.

Q. (Reading:) "I have never seen an analysis of the water, but it is soft and was always clear while I was at Columbus. I saw nothing in its appearance or surroundings to make me doubt its fitness for a city supply?"

541 A. That was true.

Q. Did you make that statement after you examined the two reservoirs of the present supply?

A. Yes, sir; that applied to the condition of the water at the time I saw it.

Q. You also spoke of the surroundings?

A. Yes, sir.

Q. The surroundings that then existed?

A. I meant the character of the water shed.

Q. And the conditions that then existed, the surroundings?

A. Well, that word surroundings didn't cover the way the reservoir was constructed. I meant by surroundings the character of the water shed that the water was coming from.

Q. Let me ask you: You made some very elaborate suggestions of

changes in the system in the event they continued to use the present supply, didn't you?

A. Yes, sir.

Q. This plate here shows the actual conditions as they existed at the reservoirs, depths and widths?

A. Yes, as they were (Plate II opposite page 24).

Q. Just as then existed? In this elaborate report on the system to the city, you spoke of the quality of the water, its appearance and surroundings, you said nothing about the thin edges or feather edges, did you or the lack of filter plant?

A. I don't think I did. If I did it is in this report. I don't think I treated on that question especially.

542 Q. Now you will of course have a better chance to read this more closely at the noon recess, if you have not already read it: I will ask you this question: The proposed source of supply that you expected to get for the city was what was called Roaring Creek, wasn't it?

A. Well, I don't know that that was especially the proposed source of supply, simply compared with the other.

Q. It was the one that your report rather treated on, didn't it?

A. It simply showed a larger place for a reservoir—larger storage basin—larger supply basin; but my recollection is that it was not considered as being at all necessary; because I showed that the supply could be gotten from Holland's Creek.

Q. You did though in plate V give a very elaborate description of what would be necessary to give them a first rate source of supply, and what Roaring Creek could give, the height of the dam and the size of the dam and the kind of construction and other work and an estimate of the cost?

A. In order to have a large storage basin.

Q. That's true, isn't it?

A. I don't remember what the immediate capacity was there.

Q. You remember though that you gave your opinion of what you considered would be a first rate system, based on that source of supply?

A. Yes.

Q. You only had one reservoir there?

A. Yes.

543 Q. You didn't have a separate settling basin and a clear water basin?

A. No, only had one large basin and provided for keeping the muddiest water out of that and sand and filth out of it.

Q. Where you only had one reservoir or one basin, the only way you could prevent the muddiness would be by storm ditches?

A. Yes. Where you have two basins, if you use them both—if you use the upper basin——

Q. Provided you use the upper basin for your direct source of supply?

A. If your storage is not sufficient so you can trust your lower basin all the time and your water is muddy in your upper basin, you have got to draw muddy water.

Q. Of course you can use your upper basin to keep your lower basin full?

A. You can if your upper basin is big enough, otherwise you can not.

Q. In the system that you proposed, did you count in the element of feather edges?

A. Yes, sir.

Q. Will you show me where you counted them in as one of the items of cost?

A. I think so. I don't know whether it is there or not.

Q. Look over your report and say whether you in any way referred to the matter of feather edges even in the Holland Creek system or the Roaring Creek system, which you recommended?

A. I remember distinctly that I took that matter into consideration in this reservoir; but I am——

544 Q. At the noon recess I would be very glad if you would find whether that is referred to?

A. I remember distinctly that I did take that into consideration and considered it as part of the cost. I knew it was necessary.

Q. You did not in your report call the attention of the city to it did you?

A. I don't remember whether I did or not. I think that I did. That's my recollection.

Q. Please look over your report and see if you did. You referred to what should have been done at that time under the present system?

A. Let me get this—make a note of what you require of me.

Q. You stated in answer to Mr. Wimbish, that the science-filtration existed in 1893: In calculating for the city the cost of a system—the ideal system that you planned for them for the present and future needs of the city, did you count in a filtration plant or filter of any kind?

A. I think not. I think they trusted to settling basins at the time. That's my recollection, they trusted to settling basins; but with the knowledge of the fact that they would probably make a filtering plant an addition to it. Didn't cover it in the estimates.

Q. Nowhere in the report which goes very elaborately into the present and future needs or requirements of the city or future extensions, did you refer to the cost or the necessity of a filtering plant or any system of filtration, did you?

A. I will say I did. I will say at that time that there was

545 not the same stress laid on filtration that there is at present. Was not the same stress laid on it, still it was being done.

Q. Sometimes being done?

A. It was being done.

Q. You didn't regard that as one of the things to be done?

A. It was being done mainly to correct the muddiness of the water. Whenever it could be done otherwise, it was being done generally.

Q. The system that you found here with the settling basin and the by-pass to keep off the storm water from that settling basin and rock edges to the clear water basin and rock bottom to the clear wa

basin, that, as far as your investigations went, protected it from muddy water?

A. On a small scale it would have done it, if it had been large enough.

Q. You referred to no need of doing anything to protect against muddy water, did you, there in the Holland Creek system, other than what was done?

A. Nothing except a larger storage basin and in this storage basin to keep the storm water out of it. It was done very frequently at that time and is still done.

Q. There was not, in the system you contemplated putting in for the city, contemplated any filtration at all of any kind?

A. Well, that was contemplated in my calculations for the future; but not put in the report, that I know of.

Q. That you had in mind?

546 A. I regarded that as a question that would come up later in case they found the muddiness of the water sufficient to interfere with it.

Q. I am asking you what you had in your report, not what you had in mind: In the very full elaborate report covering 51 pages, dealing with every phase of the question, for *for* the future and for the present, that was not referred to or thought worth while to mention at all?

A. I will state in this report nearly everything I said was in answer to direct questions from the committee. Those questions I answered as they were asked. If they asked anything about filtration, I probably answered it.

Q. Isn't it a fact that in addition to the answers to the questions set out in the report, you made an independent report covering the entire ground?

A. Yes, and I think nearly everything I said in that independent report was probably reiterated and brought out again by those questions. That's my recollection. I was making an examination for a committee of the city and answered the questions that they asked at the time.

Q. Then Mr. Hall, you answered every question that the committee put to you, didn't you?

A. I think so.

Q. Everything that the committee thought worth while to direct their questions to, based upon the present condition of things, you looked into, investigated and reported?

547 A. That was my intention, I am certain.

Q. Mr. Hall, you say you answered all questions that the committee put to you: That's true, isn't it?

A. That's my recollection.

Q. You made these lines of investigation and pointed out those defects that were in the mains that they stated to you, that's true?

A. That's my recollection.

Q. The committee gave considerable time to this investigation in aiding you in directing your inquiries?

A. They did.

Q. They were very active in the interest that they gave to this investigation, were they not?

A. I think so.

Q. They were leading citizens of Columbus—representative citizens?

A. They felt a great interest in it, I remember, at the time and gave every facility that was possible for the examination.

Q. And promoted the investigation by directing inquiries to the different defects that were supposed at that time to exist?

A. Yes, sir.

Q. In directing these inquiries as the committee thought at that time to these supposed defects that existed, the lack of a filter was not one of those supposed defects that your attention was directed to?

A. If it is not in the report—I have not examined the report. I prefer to examine the report before saying that it is not.

548 Court here took a recess for dinner.

Afternoon Session.

Court met pursuant to recess for dinner and the hearing was resumed.

Examination of witness B. M. HALL was resumed:

(By Mr. WIMBERLY:)

Q. Have you had an opportunity of making the calculations that I asked you for?

A. I have not had time to do it. It took too long to get my dinner at the restaurant; and I only had a little while left. I have not found anything with reference to filtration.

Q. Have you recently made an examination of the present system, or is your testimony based mainly upon what you found in 1893?

A. I made an examination of the reservoirs recently.

Q. Did you make re-calculations or just some soundings and then a rough estimate?

A. I made a re-calculation of the upper reservoir.

Q. The lower, I believe, is unchanged?

A. The lower is unchanged. I don't think it had a chance to get mud in it.

Q. With rock sides and rock bottom there would be no change in capacity?

A. I assumed that there would be no change. I did not take soundings; but judging by the surroundings there would be no special change.

549 Q. Have you made any examination of the system on this side of the river? I mean by that the pumping station, engines, new standpipe, filter plant and pipe extensions?

A. I saw the new stand pipe on Rose Hill and I was also told that there had been some additions made to the height of the present stand pipe. That I don't know except from having been told.

The MASTER: The height of what?

A. To the old stand pipe. That there had been added 10 feet and something.

Q. I think there has been ten feet added: The evidence will show?

A. I was so informed; but I don't know that to be the case.

—. The pipes that have been laid in the new annex, have you examined those extensions?

A. Nothing except the plans that I have seen here. They are under the ground—in the ground and of course it would be very hard for me to examine them intelligently without having seen them laid or taken up.

Q. A system derives its strength by the arrangement of its pipes as a whole very largely, does it not: I mean by that a particular size main will be more or less powerful in the way of pressure it will give, according to the distance from that one to the larger main that it is a feeder from or the shortness of the distance?

A. The shorter the distance the more efficient the particular main will be. The shorter the distance between the two ends that
550 are joined to the larger pipe.

Q. Then a four inch main communicating at a short distance with a ten inch main is more efficient than if it is a good long distance from it?

A. Yes, so much per 100 feet, for any certain velocity the water is to have.

Q. A four inch main that is a dead end is less efficient than a four inch main that is tied in at both ends?

A. Yes.

Q. So as to get its supply of water from two directions?

A. Yes.

Q. With a sufficient number of mains leading from the new Rose Hill stand pipe, it would be possible, would it not, by making the proper valve openings and valve closings, to give the lower part of the city a pressure based upon the elevation of the Rose Hill standpipe?

A. If you made those mains large enough.

Q. Or enough*t* of them to answer the same purpose?

A. Yes, if you put in enough; but I don't think it would be economy to do it.

Q. Not speaking about whether it would be more economical but what can be done?

A. O, you could put in enough of them to give the pressure.

Q. Now say this is the location of the Rose Hill standpipe and this is the Broad Street stand pipe, I will call it, the one for the lower city, and with these three pipe here, two of them 12 inch and
551 the other 8 inch, these two running down here each six inch; and from this stand pipe the pressure either way, this direction the water can come down and over this and around again on this street; and in addition to that a pumping station sufficiently near, and these two 12 inch mains to re-enforce the stand pipe pressure from Rose Hill, with the requisite direct pressure, you can give to the pressure of the standpipe to the lower part of the city, can't you, pressure based upon the height of the Rose Hill standpipe?

A. Not to the Broad Street stand pipe, unless you cover it.

Q. I don't mean the standpipe, I mean the portion of the city below that gets its pressure from Broad Street standpipe, by turning a valve so as to cut off the Broad Street standpipe and by opening a valve so as to let on the other?

A. With the pressure in the outside pipe—in the pipe itself?

Q. Say it closed automatically?

A. A check valve from the outside?

Q. Yes?

A. You get direct pumping—you get in effect direct pumping and use your Rose Hill stand pipe as a safety valve.

The MASTER: You mean by that this pressure that you have from the standpipes should be supplemented by the pump pressure?

552 A. Yes, your water is introduced into the main without having to go into the Rose Hill standpipe and come back again. With this pump in use if your pressure gets above a certain point, the Rose Hill standpipe will run over.

Q. It serves as a safety valve, so that if it should get to the point where it would break the pipes, without shutting off the pump, and you would get pressure greater than is represented by gravity pressure from the height of the standpipe?

A. That would be true. It would not be true if the pressure was brought very high, with more velocity, so that the friction against these pipes going to Rose Hill might burst the pipe.

Q. If your pump was of such capacity as to put water into the pipe faster than the pipe can let it out or into the Rose Hill stand pipe, you might get the pressure too high?

A. Might get a dangerous pressure on some portion of the system.

Q. In other words: you might, with sufficiently powerful pumps—I mean by powerful, beyond the size of the pipe leading up to the standpipe, you might get direct pressure in portions of your system this side of the standpipe greater than that furnished by the standpipe elevation?

A. Greater than hydrostatic pressure.

Q. For instance: to illustrate: You have two large powerful pumps, each of a pumping capacity of a thousand gallons per minute, and the water that is carried to the stand pipe is limited by two six inch pipes leading to that standpipe, if you were to run those pumps at

553 their full capacity, then all of the pressure they would put into the pipe over and above what would be relieved by the size of the pipes leading into the standpipe, would take the form of direct pressure?

A. Take the form of direct pressure in the particular part of the system into which that was introduced.

Q. So that with as much as two 12 inch pipes leading from the pumping station—two six inch pipes leading from the Rose Hill standpipe down to the pumping station and from the pumping station on down throug- 12 inch pipes, with the pumps running, with that size pipes leading from the pumping station down to the Broad Street standpipe, and an automatic arrangement by which the pressure becomes—strong enough automatically to cut off the pressure and opens——

Hill pressure and supply it after the Rose Hill pressure had begun to fail.

Q. Mr. Hall, I wish you would look at the map you have in your hand and state what additions or improvements have been made since 1893, if you can do so without too great delay?

A. Well, the biggest improvement that I see is the erection of the Rose Hill standpipe and the mains that exist in that vicinity.
522 At the time I made the examination in '93, it was confined to the lower part of the city and there were few mains up as high as 18—18th or 19th Streets. There was a few mains up that high at that time but not the Rose Hill supply.

Q. Have there been any substantial additions or changes to the system down town as to either the sizes of the pipes or extensions?

A. I find the same main down Broad Street. Don't see any difference. Goes one block of 12 inch main and three blocks of ten inch main and three blocks of 8 inch and two blocks of six inch, in the old system. In this new system: one block of 12 inch, three blocks of ten inch, two blocks of eight inch and four blocks of six inch. That would appear from this map that I either had one block too many of eight inch pipe, or else in this system they have one block too short. On that they don't correspond. They correspond everywhere else except in this respect. One block shown on the last as six inch that is shown as eight inch on my system in 1893. I took my information from Mr. Tuggle, of the water works company.

Q. Who was Mr. Tuggle?

A. Mr. Tuggle was superintendent—an official of the company. I think he was superintendent.

Q. I will ask you to look to that map as to where the four inch mains are and say how they compare?

A. Taking the next street, that is, First Avenue, which is next to Broad. On First Avenue, the present system has five blocks of four inch mains and a missing block with no main on it. The old
523 system had only four blocks of four inch main and a missing block, and probably a four inch there (referring to map). Approximately the same, if that's a four inch—it is hardly legible—the presumption is it is a four inch. They would not have taken out a six inch pipe and put in a four inch. Might have taken out a four inch and put in a six inch. Looks like a six or a four. Intended as a four. It is a four on this last one. If it is a four it is identical, so far as that is concerned.

Q. Taking the map that you have, do you see any substantial extensions or improvements?

A. I don't see any place where a four inch has been taken out. On Sixth Street I see a line of six inch pipe there (referring to map). Along in here. Does not state whether it was a four or six. Must have been a six. On Sixth Street from Broad Street over to about 7th Avenue. The new map you have shows it to be six inch pipe. On my map it shows a pipe in there without showing whether it was a six or four. I presume I had it in my summary of the amount of pipe, which was also taken directly from their statement, not from

my map. Didn't take it from my map. I made my map out according to what information I could get from the company; and then I made out that list or amount of pipe from their statement submitted to me as the facts of the case. That particular line must have been at that time a six inch pipe, probably was—it is here. It may have been a four inch. If it was, it has been replaced by a six. I don't see any material change. That is positive enough. There may be additions that I have not found.

524 Q. I don't mean slight, I mean substantial additions or changes?

A. On Tenth Street the six inch pipe has been run two blocks further out than it was before, going east. Sixth Avenue has had an addition to it. From the corner of Tenth and Sixth Avenue down, there are four blocks of six inch pipe. The four is an addition. These two blocks were in before and then it comes to four inch pipe. (Referring to map).

Mr. WIMBERLY: There are now how many?

A. Four more blocks. The addition is that there are four blocks of six inch pipe that was not there. There is also four inch pipe that has been added to the system at the upper end of the system. There is a block and a half of four inch pipe that was not there at that time—that's Fifth Avenue I am talking about now. I got on the wrong Avenue accidentally. I will go back and correct that statement. I was looking at Sixth Avenue. Beginning with 12th Street and going down town—I got switched off to that street, so close together. There are six blocks of six inch pipe that was not there at that time. I don't see any other changes. I have already stated that but stated it in reference to the wrong street. On Fifth Avenue, there was a vacancy at that time of four blocks and there is still a vacancy of four blocks. This is 5th Avenue here; and it shows that there was a vacancy of four blocks there and that vacancy is there now.

Q. In '93?

525 A. Yes. On Fourth Avenue six inch pipe has been laid on one block there and tied together that was not along there —was a vacancy at that time. Six inch pipe has come in on one block. No change on 5th; and one block on 4th and six blocks on Sixth Avenue of six inch pipe.

Q. Is the system as you found it in '93 and as changed up to the present time, such a system as is sufficient to furnish an adequate water supply to this city for domestic and fire purposes, if not, why not?

A. It is not according to my opinion.

Q. Please state in detail why it is not and your opinion on the various points?

A. In the first place the large pipe are not large enough. The medium sized pipe are not large enough. The four inch pipe ought to be out altogether as the system exists. In laying a system of mains, you lay your mains for fire service; and when you get a fire service you will want a domestic service—the domestic service comes in as a natural consequence; and takes up very little of the fire protection, almost nothing in a properly laid system of mains. If you

have a system of pipes that are adequate for fire service, you don't need a duplicate or another system laid for domestic service. Therefore, if you put in a system that is adequate, giving large enough pipe for the mains and tying them together often enough, doing away with dead ends, why you would have no use for a smaller system running parallel.

526 Q. What about the source of supply, the pipe leading from the reservoir to the city, its size?

A. It never has been sufficient since I have known it to furnish domestic or fire service to this city, under any reasonable conditions, both in pressure and quantity.

Q. Is it capable of extension, changes or enlargements so as to adapt it to proper service, without practical re-construction?

A. I think not. I don't think it would be good policy to attempt to use it as a part of the system, a pipe only 12 inches in diameter. Don't think it would be economy to do it. It is an old one also.

Q. Now speaking of the whole system?

A. I don't think it would be economy to use the whole system, considering the mains and so on. They are all too small for the purpose. Some of the pipe could be taken up and laid at other places. As it exists now the largest size pipe are put at points demanding the largest pipe but they are not large enough.

Q. At that point?

A. At that point. They would be large enough for some points, provided the pipe was good and clean—good as new—large enough for some other points.

Q. Taking into consideration the age of the pipe, which we will admit to be 20 years, and the plan of the system and the system as it is actually constructed, I will ask you if you could practically change the system as to make it adequate or would it be necessary to practically re-construct the system or build a new one?

527 A. I think it would be best economy to buy new pipe and put it in, making a larger and complete system independent of anything that is in it. I don't think reconstructing the old system and the necessary changes that would be in order to use part of the material would be for the best, having to take it up and put it down again and making the necessary connections and everything of that kind. I think that it would be cheaper to buy new pipe and dig new trenches and put them in it.

Q. Would that still be true, be necessary to re-construct the system without regard to the source of supply?

A. If you had plenty of water?

Q. Yes?

A. If you had plenty of water, yes, that would be true. Other cities have plenty of water and unlimited pressure because they pump direct—steam pumps and have larger mains and better distributed maines necessary in order to meet the needs.

Q. How are the mains distributed in this city, properly or improperly, the distribution system?

A. Improperly. A system in the heart of a city, such as this is where it is built up so, ought to have water mains on every street.

Ought to be large mains, nothing less than six inches anywhere, and all ought to be connected up. Ought not to be any missing places or missing blocks or streets on which there are no water mains.

528 Q. What effect does dead ends have upon the system?

A. The water has to come in from one way and it limits the supply. If you have a hydrant with two mains coming to the hydrant, one from one way and one from another, you have it to draw on from both mains. You should have the system connected up so that you can get the water from both ways. You draw one half of the water through this pipe and one half the amount through the other pipe; and you won't have as much friction in it and you get more water for the same pressure. Now if you have a dead end or a hydrant on the end of a pipe, and the water coming from only one way so you had to depend solely upon that one pipe, a water tap on that pipe has to draw water from that one pipe, the houses and hydrant and so on has to draw water from that one pipe; and if you make a heavy draught on it, you reach the limit of that pipe's capacity and you can't go beyond that. A dead end also has its effect on the quality of the water. Long intervals where there is not enough draught on it to keep the water in circulation, causes the water to stand and stagnate and makes bad water in a dead end, which is very undesirable. If it is connected up, some water will be flowing through it all the time. A hydrant a quarter of a mile away will be drawing water past that hydrant or point of connection.

Q. What is the effect upon the pipe with reference to its impregnation with impurities from muddy, impure, or foul water flowing into it, especially at or near dead ends?

529 Q. What effect would that have upon the pipe itself?

Q. As to impregnating it with impurities?

A. If there are specific germs in the water, say typhoid fever germs or any contagious germs—disease germs, they would get in the slime on the inside of the pipe and remain there a long time; and it would be very hard to get them out, even if you get clean water into it.

Q. In the dead ends?

A. From the fact that they have got a lodgement—a place to lodge in the slime and mud in the pipe.

Q. Going to the source of supply now: Would it have been feasible to have filtered the water from Holland's Creek from the reservoir?

A. Ten years ago?

Q. Yes?

A. Yes. Atlanta was filtering her water at that time very successfully.

Q. How was it in '91?

A. I will have to trust to memory as to the date: My recollection is that Atlanta was filtering her water at that time. I examined the filters—I think I examined the filters at that time, the Hyatt System of filters, which is practically or approximately the same principle that *were* generally in use. How long filters had been successfully used before then I don't know. It was not anything very

new at that time. The system of mechanical filtering, the use of alum as a coagulant was then in use successfully, my recollection is.

530 Q. You mean the use of alum, together with the mechanical and sand process?

A. Yes. The alum is used simply as a coagulant.

Q. Suppose they had constructed in the reservoir a piece of masonry, consisting of two circular concentric walls——

Q. You mean a filter or reservoir?

Q. Yes, a filter, consisting of two concentric walls, arranged in annular positions, about 12 feet distant from each other, and having an internal diameter from the inner wall of from 40 to 50 feet, the outer having about 24 feet greater diameter. These walls to form a structure for containing between them, gravel, sand and filtering materials, through which all water supplied to the water main shall pass before being distributed to the city?

A. If that had been carried out it would have improved conditions there, I think. When I say carried out, I mean as to construction and operation. Filtration through 12 feet of sand and gravel would have had a very marked effect upon it.

Q. Suppose two reservoirs had been constructed of a capacity of 125,000,000 gallons, and the upper reservoir should have had marginal depths of not less than four feet, what effect would that have had both upon the supply and the quality of the water furnished the city?

A. Well, I am satisfied that it would have had the effect to have bridged over times of the worse droughts. I feel in a general

531 way it would have bridged over times of extreme drought—of low water.

Q. In other words, a storage reservoir of that capacity would not have suffered for the lack of water at those droughts?

A. That's my opinion, would not. Plenty of water in the stream. No trouble about the amount of water that comes down that stream, if you take flood water and all, if you have a reservoir large enough to catch it when it comes. If your reservoir lets it run over and down the stream, then you lose it and all you have to rely on then is the low water flow, which is very limited in a stream of that size. You can get a good supply of water from a stream anything like that size from a rain storm; and it is only a question of storing the water and holding it back when it comes when there is flush water.

Q. If they had done that, as I understand, they would have had plenty of water for all reasonable purposes?

A. I think during ten years past or during that time I made my examination, during any time, if they had had a reservoir of 125,000,000 gallons storage, they would have successfully past over these seasons of drought, if they had had the storage reservoir deepened and the edges so as not to form stagnant water and bad conditions.

Q. If they had had these marginal depths and proper protection by storm ditches and attempted also to have filtered the water, according to the best process then known, what in your opinion

532 would have been the quality of the water?

A. You mean the best process then known?

Q. Yes?

A. The best process that was used or practiced to have improved it, as time went on?

Q. Yes?

A. Why, there would have been a very marked improvement. They could have come to the system of mechanical filtration—slow filtration and could have got plenty of gravity—plenty of gravity head to do it. They could have had a system of storage, if they had had a pipe big enough to bring it and they could have had more pressure.

Q. Well now if these precautions had been taken by them as to supply and quality of water, would the water have become so impure and so foul as to be unfit, not only for domestic use but for bathing purposes?

A. It would not. I think I can answer most emphatically it would not, if those precautions had been taken.

Q. Notwithstanding as severe drought as they had in 1902?

A. I think it would have passed over that drought. Of course that is a matter of opinion. That is my opinion. I think it would have passed over that drought successfully.

Q. How was the drought of 1902 as compared with droughts in previous years?

A. I don't remember offhand. It is local—these conditions
533 are purely local. In other words: what would be true of one water shed or of one particular vicinity, might not have been true of the whole country. For instance: the lowest water that we have ever had within my knowledge, in a general way on the streams all over the State or all over the South, was in '96 and '97; and it is my recollection that this particular basin—Holl-d Creek basin, held out better during those seasons than it had some previous seasons and some seasons since. That was simply a matter of general knowledge—general hearsay; because I was not on the streams at those times. I never heard the complaints during '96 and '97 that I did at other seasons, showing that local conditions affect it. It is a small local water shed, subject to local rains, and so on.

Q. That would be represented fairly by the rain fall in the City of Columbus?

A. I think so. I think the rain-fall in the City of Columbus would represent it.

Q. It was a part of your duty, as a government official, to take the gauge of running streams, wasn't it?

A. Has been from 1895 up to the present time; but not at that time. I was not connected with the government service at that time.

Q. Do you know whether any statistics of the rain fall was kept for this city?

A. I found the rain fall had been kept and I made a statement of that in this report of the rain fall, if I could get hold of it, that

had been kept by the Weather Bureau—United States
534 Weather Bureau, Agricultural Department. I think by reference to that I could find it.

Mr. WIMBERLY: I think in a matter of this sort that we ought to have the official records.

Mr. WIMBISH: I am going to get that. I really did not intend to go into this evidence now.

Q. Mr. Hall*w*, when you were here in '93, did you make a careful estimate of the value of the Columbus Water Works System, what it would cost to re-produce it?

A. Yes, sir; I did.

Q. Please state what that was; and give the items as you gave them?

A. I made a careful estimate of what it would take, the cost of the pipe and the cost of laying the pipe, and everything else that I could take into account; and I made what I believe to be a correct estimate. Two reservoirs—do you want a detailed statement?

Q. Yes?

A.—

Two reservoirs	$18,000
20,000 ft. 12 inch pipe at $1.05 laid	21,000
Stand pipe	10,000
3,700 ft. 10 inch pipe at 85 cents laid	3,145
7,900 ft. 8 inch pipe at 65 cents laid	5,135
30,500 feet 6 inch pipe at 51 cents laid	15,555
24,500 ft. 4 inch pipe at 36 cents laid	9,920
Specials for above mains	355
1,800 ft. of 12 inch extension at $1.05	1,890
	$85,000
535 Allowance for 18 inch pipe across the river, service pipe, meters, land for reservoirs, etc. and for contingencies	35,000
Total	$120,000

Q. Now suppose since that time the Rose Hill standpipe has been built at a cost of $5700. and 30,000 feet of six inch mains laid at $17.50 a ton?

A. Stand pipe on Rose Hill $5700?

Q. Yes?

A. And how much six inch pipe?

Q. 30,000 feet at $17.90 a ton, that is exclusive of the laying of the pipe?

A. I have somewhere in my statement—in my papers a statement of the price of pipe at the time I made this estimate. I don't remember exactly the comparison between the prices of pipe at that time and the price at this time.

Q. In '93 it was approximately as high as it is now, wasn't it?

A. That's my recollection. I would have to refer to my books—

look carefully through my old work to find it. I think, however that I have it stated in this publication, the price at which I figured, if I can find it.

Q. Suppose since that time a standpipe has been erected at a cost of $5700. and there had been laid 30,000 feet of six inch mains, what could that system be now re-produced for?

Objected to as illegal, immaterial and incompetent and that there are no facts in the evidence upon which such a hypothetical
536 question could be based.

(Question withdrawn by Mr. Wimbish.)

WITNESS: I find in my report, page 47 a table of the estimated cost of cast iron mains in Columbus, Ga. per foot of length.

Q. At the prices you estimated?

A. That is the cost of pipe laid in place. Now what I want to find is the cost per ton (first column). I find that six inch pipe is estimated at $22.20 a ton.

Q. Six inch and eight inch at the same price?

A. Yes. That will give a proper basis for calculating the items when they come up. I was very careful in my estimates at that time in what it would cost to dig the trenches, lay the pipe and fill them—all complete—for the work, so that I could find how much I allowed for the cost of the pipe itself per foot and the cost per foot for trenching, which will save my making this calculation over again. I made a very careful estimate at that time and made it from actual work that was done.

Q. You refer to the table on page 47?

A. Yes, sir.

Q. I will ask you if what you hold in your hand is the report you made in 1893?

A. Yes, sir.

Q. Does it actually state the facts as you found them?

A. It represents them. I have not found any mistakes in it that would be different from the facts as I found to be the facts. There is only one thing different in it at all, and that is a typo-
537 graphical error in plate III, some seven inch pipe put in there. If you will look at plate III, which is next to page 24, you will find it. The system of mains there you will see on Second Avenue between 12th—between 10th and 14th—between 11th and 14th Streets, there is some 7 inch pipe put in there. That was evidently a mistake. That should have been a four. Then on Second Avenue in this old map, from 11th Street—between 12th and 15th on Second Avenue, there are according to the new map, three blocks of four inch pipe and one block of six inch pipe——

Q. Which is six inch? (Referring to map.)

A. Down towards the lower end, next to 11th—I say between 12th and 15th, between 11th and 15th.

Q. 15th or 14th?

A. 15th. Between 12th and 15th there are three blocks of four inch pipe and between 11th and 12th there is one block of six inch pipe, on this new map. Now according to the old map, on that

same Avenue, between 12th and 11th, there is one block of something that is uncertain. Looks like a four. Between 11th and 15th there are three blocks of seven inch pipe, which would have been a four probably by drawing a horizontal mark on that seven.

Q. Should have been four?

A. Yes, sir.

538 Cross-examination.

(By Mr. WIMBERLY:)

Q. Please look on page 47 (of Hall's report), now, in the column of cost?

A. Cost per ton?

Q. Yes, in the second column: The estimate you made of the cost of re-producing the system as it then stood, was based on the cost per ton of iron pipe at Columbus, at the figures shown in column two, in the table on page 47, namely: $22.70 for the four inch, six and eight inch at $22.20, and 10, 12, 14, and 16, $21.70. The 14 and 16 go beyond the immediate system—present system?

A. Yes, sir.

Q. Do you know the present price of cast iron pipe laid down in Columbus: Have you looked that up?

A. I have not looked it up. I thought I could look it up when I came yesterday; but I did not get here until last night.

Q. If the estimates of other witnesses are correct, that is where they are laid down in Columbus, upon an average shows it to be about $33 per ton, then there would approximately be an addition of fifty per cent. to the cost of the pipe?

A. In the pipe at present?

Q. According to the estimate you made at that time?

A. I expect not. I don't know. I don't think there would be much difference in the cost in the laying of it; but the first cost of the pipe there would be, yes.

Q. Do you know how the price of labor in Columbus now compares with what it was in '93? Have you looked into that
539 since you have been here: You have to go by what the people here say about that?

A. I think I would have to go by the present labor conditions; though my recollection is that I made a liberal allowance in that labor account; that I didn't put it down on a very close, low basis; because I knew at *at* that time that labor would cost more than you would expect to get it on a farm, anything of that kind.

Q. The quantity of labor done and labor itself is a fluctuating element?

A. Yes; but I put that on such a basis as was usually found in city work. My recollection is that I took it from actual work that the city of Atlanta was doing at that tim.e

Q. You took it on a basis of what labor was costing in Atlanta?

A. Yes, because it was close by me there and I could see what was being done and knew pretty well what it was costing.

Q. You spoke of the cost of lead: You made one item of that. Lead is what makes the joint connections?

A. Yes, the lead is poured into the joint in order to make it water tight.

Q. Lead is also more expensive now?

A. I have not looked into the present prices of lead. That I expected to do, as I say, when I got here.

Q. All building materials and structural materials at this time, on account of the very active condition of improvements within the last few years are considerably higher?

A. They have been but they are going down very rapidly.

540 I know in a good many items they are going down so rapidly that people would not make purchases on account of it.

Q. The same approximate proportion difference in the cost of iron pipe is true also with the cost of tees, crosses and iron fixtures of different sorts?

A. Yes, it would probably be a level change—would be uniform.

Q. I believe you stated that you made this very elaborate report of some 51 pages—printed pages, besides the index, to the City of Columbus, as to the entire conditions of the system after a most thorough examination?

A. Yes, after a very careful and thorough investigation with an inventory to get at the exact facts.

Q. You not only took into consideration the exact facts as to what then existed; but they also wanted to know from you what a system would cost to supply the present and future needs, including a large annexed territory that had been annexed since this contract was made: That's true?

A. Yes, sir.

Q. On the question of the quantity of the water as it then existed, you made this report on page 23?

A. Yes, sir.

Q. (Reading:) "I have never seen an analysis of the water, but it is soft and was always clear while I was at Columbus. I saw nothing in its appearance or surroundings to make me doubt its fitness for a city supply?"

541 A. That was true.

Q. Did you make that statement after you examined the two reservoirs of the present supply?

A. Yes, sir; that applied to the condition of the water at the time I saw it.

Q. You also spoke of the surroundings?

A. Yes, sir.

Q. The surroundings that then existed?

A. I meant the character of the water shed.

Q. And the conditions that then existed, the surroundings?

A. Well, that word surroundings didn't cover the way the reservoir was constructed. I meant by surroundings the character of the water shed that the water was coming from.

Q. Let me ask you: You made some very elaborate suggestions of

changes in the system in the event they continued to use the present supply, didn't you?

A. Yes, sir.

Q. This plate here shows the actual conditions as they existed at the reservoirs, depths and widths?

A. Yes, as they were (Plate II opposite page 24).

Q. Just as then existed? In this elaborate report on the system to the city, you spoke of the quality of the water, its appearance and surroundings, you said nothing about the thin edges or feather edges, did you or the lack of filter plant?

A. I don't think I did. If I did it is in this report. I don't think I treated on that question especially.

542 Q. Now you will of course have a better chance to read this more closely at the noon recess, if you have not already read it: I will ask you this question: The proposed source of supply that you expected to get for the city was what was called Roaring Creek, wasn't it?

A. Well, I don't know that that was especially the proposed source of supply, simply compared with the other.

Q. It was the one that your report rather treated on, didn't it?

A. It simply showed a larger place for a reservoir—larger storage basin—larger supply basin; but my recollection is that it was not considered as being at all necessary; because I showed that the supply could be gotten from Holland's Creek.

Q. You did though in plate V give a very elaborate description of what would be necessary to give them a first rate source of supply, and what Roaring Creek could give, the height of the dam and the size of the dam and the kind of construction and other work and an estimate of the cost?

A. In order to have a large storage basin.

Q. That's true, isn't it?

A. I don't remember what the immediate capacity was there.

Q. You remember though that you gave your opinion of what you considered would be a first rate system, based on that source of supply?

A. Yes.

Q. You only had one reservoir there?

A. Yes.

543 Q. You didn't have a separate settling basin and a clear water basin?

A. No, only had one large basin and provided for keeping the muddiest water out of that and sand and filth out of it.

Q. Where you only had one reservoir or one basin, the only way you could prevent the muddiness would be by storm ditches?

A. Yes. Where you have two basins, if you use them both—if you use the upper basin——

Q. Provided you use the upper basin for your direct source of supply?

A. If your storage is not sufficient so you can trust your lower basin all the time and your water is muddy in your upper basin, you have got to draw muddy water.

Q. Of course you can use your upper basin to keep your lower basin full?

A. You can if your upper basin is big enough, otherwise you can not.

Q. In the system that you proposed, did you count in the element of feather edges?

A. Yes, sir.

Q. Will you show me where you counted them in as one of the items of cost?

A. I think so. I don't know whether it is there or not.

Q. Look over your report and say whether you in any way referred to the matter of feather edges even in the Holland Creek system or the Roaring Creek system, which you recommended?

A. I remember distinctly that I took that matter into consideration in this reservoir; but I am——

544 Q. At the noon recess I would be very glad if you would find whether that is referred to?

A. I remember distinctly that I did take that into consideration and considered it as part of the cost. I knew it was necessary.

Q. You did not in your report call the attention of the city to it, did you?

A. I don't remember whether I did or not. I think that I did. That's my recollection.

Q. Please look over your report and see if you did. You referred to what should have been done at that time under the present system?

A. Let me get this—make a note of what you require of me.

Q. You stated in answer to Mr. Wimbish, that the science of filtration existed in 1893: In calculating for the city the cost of a system—the ideal system that you planned for them for the present and future needs of the city, did you count in a filtration plant or a filter of any kind?

A. I think not. I think they trusted to settling basins at the time. That's my recollection, they trusted to settling basins; but with the knowledge of the fact that they would probably make a filtering plant an addition to it. Didn't cover it in the estimates.

Q. Nowhere in the report which goes very elaborately into the present and future needs or requirements of the city or future extensions, did you refer to the cost or the necessity of a filtering plant or any system of filtration, did you?

A. I will say I did. I will say at that time that there was

545 not the same stress laid on filtration that there is at present. Was not the same stress laid on it, still it was being done.

Q. Sometimes being done?

A. It was being done.

Q. You didn't regard that as one of the things to be done?

A. It was being done mainly to correct the muddiness of the water. Whenever it could be done otherwise, it was being done generally.

Q. The system that you found here with the settling basin and the by-pass to keep off the storm water from that settling basin and rock edges to the clear water basin and rock bottom to the clear water

basin, that, as far as your investigations went, protected it from muddy water?

A. On a small scale it would have done it, if it had been large enough.

Q. You referred to no need of doing anything to protect against muddy water, did you, there in the Holland Creek system, other than what was done?

A. Nothing except a larger storage basin and in this storage basin to keep the storm water out of it. It was done very frequently at that time and is still done.

Q. There was not, in the system you contemplated putting in for the city, contemplated any filtration at all of any kind?

A. Well, that was contemplated in my calculations for the future; but not put in the report, that I know of.

Q. That you had in mind?

546 A. I regarded that as a question that would come up later in case they found the muddiness of the water sufficient to interfere with it.

Q. I am asking you what you had in your report, not what you had in mind: In the very full elaborate report covering 51 pages, dealing with every phase of the question, for *for* the future and for the present, that was not referred to or thought worth while to mention at all?

A. I will state in this report nearly everything I said was in answer to direct questions from the committee. Those questions I answered as they were asked. If they asked anything about filtration, I probably answered it.

Q. Isn't it a fact that in addition to the answers to the questions set out in the report, you made an independent report covering the entire ground?

A. Yes, and I think nearly everything I said in that independent report was probably reiterated and brought out again by those questions. That's my recollection. I was making an examination for a committee of the city and answered the questions that they asked at the time.

Q. Then Mr. Hall, you answered every question that the committee put to you, didn't you?

A. I think so.

Q. Everything that the committee thought worth while to direct their questions to, based upon the present condition of things, you looked into, investigated and reported?

547 A. That was my intention, I am certain.

Q. Mr. Hall, you say you answered all questions that the committee put to you: That's true, isn't it?

A. That's my recollection.

Q. You made these lines of investigation and pointed out those defects that were in the mains that they stated to you, that's true?

A. That's my recollection.

Q. The committee gave considerable time to this investigation in aiding you in directing your inquiries?

A. They did.

Q. They were very active in the interest that they gave to this investigation, were they not?

A. I think so.

Q. They were leading citizens of Columbus—representative citizens?

A. They felt a great interest in it, I remember, at the time and gave every facility that was possible for the examination.

Q. And promoted the investigation by directing inquiries to the different defects that were supposed at that time to exist?

A. Yes, sir.

Q. In directing these inquiries as the committee thought at that time to these supposed defects that existed, the lack of a filter was not one of those supposed defects that your attention was directed to?

A. If it is not in the report—I have not examined the report. I prefer to examine the report before saying that it is not.

548 Court here took a recess for dinner.

Afternoon Session.

Court met pursuant to recess for dinner and the hearing was resumed.

Examination of witness B. M. HALL was resumed:

(By Mr. WIMBERLY:)

Q. Have you had an opportunity of making the calculations that I asked you for?

A. I have not had time to do it. It took too long to get my dinner at the restaurant; and I only had a little while left. I have not found anything with reference to filtration.

Q. Have you recently made an examination of the present system, or is your testimony based mainly upon what you found in 1893?

A. I made an examination of the reservoirs recently.

Q. Did you make re-calculations or just some soundings and then a rough estimate?

A. I made a re-calculation of the upper reservoir.

Q. The lower, I believe, is unchanged?

A. The lower is unchanged. I don't think it had a chance to get mud in it.

Q. With rock sides and rock bottom there would be no change in capacity?

A. I assumed that there would be no change. I did not take soundings; but judging by the surroundings there would be no special change.

549 Q. Have you made any examination of the system on this side of the river? I mean by that the pumping station, engines, new standpipe, filter plant and pipe extensions?

A. I saw the new stand pipe on Rose Hill and I was also told that there had been some additions made to the height of the present stand pipe. That I don't know except from having been told.

The MASTER: The height of what?

A. To the old stand pipe. That there had been added 10 feet and something.

Q. I think there has been ten feet added: The evidence will show?

A. I was so informed; but I don't know that to be the case.

—. The pipes that have been laid in the new annex, have you examined those extensions?

A. Nothing except the plans that I have seen here. They are under the ground—in the ground and of course it would be very hard for me to examine them intelligently without having seen them laid or taken up.

Q. A system derives its strength by the arrangement of its pipes as a whole very largely, does it not: I mean by that a particular size main will be more or less powerful in the way of pressure it will give, according to the distance from that one to the larger main that it is a feeder from or the shortness of the distance?

A. The shorter the distance the more efficient the particular main will be. The shorter the distance between the two ends that
550 are joined to the larger pipe.

Q. Then a four inch main communicating at a short distance with a ten inch main is more efficient than if it is a good long distance from it?

A. Yes, so much per 100 feet, for any certain velocity the water is to have.

Q. A four inch main that is a dead end is less efficient than a four inch main that is tied in at both ends?

A. Yes.

Q. So as to get its supply of water from two directions?

A. Yes.

Q. With a sufficient number of mains leading from the new Rose Hill stand pipe, it would be possible, would it not, by making the proper valve openings and valve closings, to give the lower part of the city a pressure based upon the elevation of the Rose Hill standpipe?

A. If you made those mains large enough.

Q. Or enough of them to answer the same purpose?

A. Yes, if you put in enough; but I don't think it would be economy to do it.

Q. Not speaking about whether it would be more economical but what can be done?

A. O, you could put in enough of them to give the pressure.

Q. Now say this is the location of the Rose Hill standpipe and this is the Broad Street stand pipe, I will call it, the one for the lower city, and with these three pipe here, two of them 12 inch and
551 the other 8 inch, these two running down here each six inch; and from this stand pipe the pressure either way, this direction the water can come down and over this and around again on this street; and in addition to that a pumping station sufficiently near, and these two 12 inch mains to re-enforce the stand pipe pressure from Rose Hill, with the requisite direct pressure, you can give to the pressure of the standpipe to the lower part of the city, can't you, pressure based upon the height of the Rose Hill standpipe?

A. Not to the Broad Street stand pipe, unless you cover it.

Q. I don't mean the standpipe, I mean the portion of the city below that gets its pressure from Broad Street standpipe, by turning a valve so as to cut off the Broad Street standpipe and by opening a valve so as to let on the other?

A. With the pressure in the outside pipe—in the pipe itself?

Q. Say it closed automatically?

A. A check valve from the outside?

Q. Yes?

A. You get direct pumping—you get in effect direct pumping and use your Rose Hill stand pipe as a safety valve.

The MASTER: You mean by that this pressure that you have from the standpipes should be supplemented by the pump pressure?

552 A. Yes, your water is introduced into the main without having to go into the Rose Hill standpipe and come back again. With this pump in use if your pressure gets above a certain point, the Rose Hill standpipe will run over.

Q. It serves as a safety valve, so that if it should get to the point where it would break the pipes, without shutting off the pump, and you would get pressure greater than is represented by gravity pressure from the height of the standpipe?

A. That would be true. It would not be true if the pressure was brought very high, with more velocity, so that the friction against these pipes going to Rose Hill might burst the pipe.

Q. If your pump was of such capacity as to put water into the pipe faster than the pipe can let it out or into the Rose Hill stand pipe, you might get the pressure too high?

A. Might get a dangerous pressure on some portion of the system.

Q. In other words: you might, with sufficiently powerful pumps—I mean by powerful, beyond the size of the pipe leading up to the standpipe, you might get direct pressure in portions of your system this side of the standpipe greater than that furnished by the standpipe elevation?

A. Greater than hydrostatic pressure.

Q. For instance: to illustrate: You have two large powerful pumps, each of a pumping capacity of a thousand gallons per minute, and the water that is carried to the stand pipe is limited by two six inch pipes leading to that standpipe, if you were to run those pumps at

553 their full capacity, then all of the pressure they would put into the pipe over and above what would be relieved by the size of the pipes leading into the standpipe, would take the form of direct pressure?

A. Take the form of direct pressure in the particular part of the system into which that was introduced.

Q. So that with as much as two 12 inch pipes leading from the pumping station—two six inch pipes leading from the Rose Hill standpipe down to the pumping station and from the pumping station on down throug- 12 inch pipes, with the pumps running, with that size pipes leading from the pumping station down to the Broad Street standpipe, and an automatic arrangement by which the pressure becomes—strong enough automatically to cut off the pressure and opens——

A. It would be in proportion to the surface in contact and we can figure that out.

Q. Have you not that in your table?

A. I don't think I have. I don't think I could turn to it if I have. In a six inch pipe it would be practically 3 1/7 multiplied by six inches.

Q. And four inches what is it?

A. That would be four multiplied by 3 1/7th.

Q. One would be six multiplied by 3 1/7th?

A. Yes, and the other would be 4 multiplied by 3 1/7th. What would that make?

Q. 12 4/7s?

A. Take two of them?

585 Q. Would be twenty four and four sevenths?

A. While the other one is——

Q. Is 18 and six sevenths. One would be nearly one and a half times as much as the other larger pipe—save about one fourth?

A. Yes. There would be less friction for the same amount of water.

Q. About one fourth less friction?

A. Under the same velocity would be less.

Q. The larger pipe——

A. The larger pipe would be in proportion, that is, the friction in the larger pipe would be in proportion to the friction in the smaller pipe—would be about as 18 is to 28.

Q. That is to say about three fourths as great?

A. Yes.

Q. These two figures, both delivering the same quantity of water?

A. Yes, take in proportion to the surface in contact.

Q. So that the great thing to be avoided to save loss of pressure, the main element is high velocity and long distance through small pipes?

A. That's right.

Q. Now I will ask you this now about the pressure due to hydrostatic—I mean hydrostatic pressure due to a head of 210 feet, with a pumping system with sufficiently powerful pumps, you could reenforce that pressure so as to get more than due to the hydrostatic head, could you not?

586 A. At some points on your system you could. It would not be very good practice to do it. It would be dangerous.

Q. That would depend upon how well your system was constructed for distributing it out?

A. Yes. Depend very largely upon it.

Q. It would be dangerous if you were to try to force through one six inch pipe the high pressure that you would through a 12 inch pipe; and you would not go as high on a still weaker part: If you were to have such a distributing system as to have a sufficient quantity of pipes leading from your pumping station down to where it leads out for distribution, so as to take care of pressure at remote portions of the system as fast as your pumps pumped it in, you could

by direct pressure get higher results than from 210 feet, couldn't you?

A. Yes, you could; because you would have velocity going the other way in that portion towards the standpipe up on the hill.

Q. You spoke of course of its being dangerous: unless there is proper provision for taking care of it that would be true in a very high gravity system?

A. Yes, more in a high gravity system than any other, as you have got your limit and you can't go beyond that.

Q. And using your engines, you have got to watch your gauge and not go beyond the strength of your pipes?

A. Yes, sir.

Q. You could not take the down town gauge and rely on that and not follow the gauge close to your engine unless you
587 were sure your distribution system was sufficiently perfect to give as much pressure down town as you had close to your engine?

A. I think that's about the proper statement.

Q. In fact all danger can be provided against by a system of valves that blow off at certain points?

A. Yes, have regulating valves at your pump that will cut off the steam when it gets up to a certain quantity.

Q. There are devices in common use by which that is done automatically?

A. Yes, that's right.

Q. In fact all engines, as a matter of fact have those devices as a general rule?

A. As a general rule a pumping engine is supplied with that kind of a device, where it is intended to pump directly into the mains.

Q. Now taking up this particular system here: All these figures are arrived at, loss of pressure with different velocities, by actual experimental tests?

A. Yes, experimental tests for the purpose of making rules for them; and those rules, having worked it out, are based on actual tests of the pipe to find out what they would do under certain conditions.

Q. Now take this system that we have got: In order to deliver water at the portions of the city I have asked about, with approximately the pressure due to the head, it would be necessary to have a sufficient number of pipes of sufficient size so as to have no very high velocities, to get a sufficient quantity of water down
588 to keep that pipe always full, isn't that right?

The MASTER: You mean the lower part of the city?

Mr. WIMBERLY: Yes, sir.

WITNESS: It will always keep full if you don't let it out. If you keep a heavy draught on it you will let out at the lower end as much as it is going to take to keep it full.

Q. What I mean by keeping full, in order to have an equivalent, you take 450 feet which is probably your standard: If the pipe that leads into that is either too small or is tapped in too many places

before it gets there for the quantity of water to be insufficient, the pressure drops down before it would reach that four inch pipe?

A. Yes.

Q. Now then: just take this system as it stands: Isn't it best to calculate and knowing the size of your pumps and their capacity, and knowing the number of pipes leading down from there to any given portion of the city, the supply of water that will be carried will be divided out between the length of each and the size of each, to calculate accurately how much the friction loss would be?

A. It is possible.

Q. In going that distance?

A. Yes, it is possible to estimate it. You have got to take into consideration all those points—all those angles you have there, and other obstructions that may be in the pipes. It is best to adopt the system that is in vogue—that is in use by other cities
589 that has been found to be adequate.

Q. No two cities have identically the same system?

A. Not identically the same systems but they have the same principles.

Q. That man that applies it he works it out on mathematical principles?

A. So as not to have any four inch pipe in the system.

Q. That was not the question I asked you?

A. I thought I would get at that answer as quickly as possible.

The counsel for complainant objected to the witness volunteering testimony; and stated that the answer given by the witness was not in answer to the question asked; and stated to the court that the witness' manner of testifying was improper.

Objection overruled.

WITNESS: I have a defense to make to that answer.

Q. Answer the last question that I asked you, whether it is a fact that these things are calculated?

A. I will make my answer this way: that they are calculated on mathematical principles; and those mathematical principles are based on actual experiments—actual experience; and that actual experience shows that a four inch pipe is too small to use anywhere in a system of mains intended for fire pressure. When you ask a question recollect that I am going to leave out four inch pipe.

Q. It will run through your testimony?

590 A. I will qualify it by saying that a four inch pipe is not big enough.

Q. If you want to put that into each question why of course you can do it without its being repeated?

A. I would not want to be understood as saying that a four inch pipe is big enough.

Q. Isn't it just a matter of mathematical calculation as to how much water a 12 inch pipe will deliver under certain conditions?

A. Yes, based on experiments as to what it will do.

Q. Those experiments have developed certain rules?

A. Yes, sir.

Q. And with those rules you can give certain specific answers?

A. That's true.

Q. Take a 12 inch supply main leading from the reservoir to the pumping station, you gave in your figures here this morning what the capacity of a 12 inch main was with a head, I believe such as you stated, 92 feet I think it was?

A. 117 feet.

Q. And that was approximately 2,000,000 gallons?

A. That's right.

Q. Now then, suppose instead of its coming through that pipe, with nothing to push it or drive it through except the hydrostatic head—nothing except the head of 117 feet, that instead of that, you were to have at this end, drawing it through the pipe, pumps of a capacity of 2000 gallons per minute—I mean by their ca-
591 pacity, capacity right at the pump, and of course such loss as would be due to the pipes, not being big enough to supply the pumps, if that was the case, would those pumps bring more water or less water throug- a 12 inch main than the 117 feet head you speak of in your report?

A. They would increase the head, that is, they would decrease the pressure on the end through which it flowed; and have the effect of making greater flow. It would be limited to what you could get from suction, which is something, in the best cases about 28 feet. That is in absolutely air tight pipe.

Q. That is, the amount due to the height, the difference in height between the head of the reservoir and the place where it is delivered at the pumps, would be increased by the amount due to suction?

A. Yes, you would take the back pressure off—the back pressure of the atmosphere, which is about 15 pounds to the square inch.

Q. Suction removes that?

A. In water tight pipe,—I mean air tight pipe. If the pipe is not air tight, leaks or something, it removes a portion of it of course; but if it can get air it won't do it. If the pipe is air tigh' it will remove the full air pressure.

Q. Atmospheric pressure is equivalent to about 34 feet?

A. About 15 pounds.

Q. 14 7/10ths pounds or 34 feet of water column?

592 A. Thirty four or thirty two, in that neighborhood, or 33 feet—15 pounds. That is about sea level—about the pressure ordinarily speaking.

Q. You say that is the limit?

A. That's the limit. The same principle. It is a simple proposition as to how high you can suck water with a pump. If you have suction in a well 20 or 30 feet long, you can't suck water up out of a well if you were to put the pump 50 feet above it.

Q. That's true if you pull it up. Suppose you are below the surface of the water, can you increase your suction greater than atmospheric pressure?

A. No, you only remove what would be back pressure of the atmosphere against it in flowing out. That's the limit of what you

can do if your pipe is air tight. If your pipe is not air tight, you might get 50 or 75 per cent. of it, that many pounds off of it.

Q. If you are lifting the water up after you raise it 34 feet and no higher, the distance left is a vacuum?

A. Yes.

Q. If the place where your pump is is lower than the level of the water and your pump is powerful enough to keep on pulling, after you remove the atmospheric pressure, you don't get any vacuum as long as you are pulling or lifting the water?

A. If you are below the level of the water, after you get the water into your pump and it goes beyond the pump into the discharge, then it becomes a different kind of pressure. It is direct
593 pressure from the pump and that depends upon the strength, of the pump and the amount of steam you can put behind the piston.

Q. Take the actual conditions—say, of course, that you have got an air-tight pipe, what would the flow through a 12 inch pipe amount to, if it is drawn throug- by pumping?

A. I have figured it out for 117 feet.

Q. How much would that be increased by an additional 30 or 34 feet, whatever it was?

A. I don't think, in a practical way, you could have that pipe air tight. I don't think four miles of one foot pipe could be practically air tight, because a little bit of a leak makes a big difference. You might say add 30 feet to that. I don't think it is probable you would add more than 20 feet.

Q. Speaking of quantity of water, how much per day would it add, in quantity of water?

A. You would add in proportion to the head—the extra head you would get there.

Q. As 20 feet is to 117 you would add that much?

A. I think that would be about the proportion. If you were to take 2,000,000 gallons and the head is say 117 feet and the other head say would be 20 feet more, which would be 137, now that would be in proportion to the square root of 117——

Q. (Interrupting.) If you depended upon a gravity system there would be some loss in the pipe, say across the river, coming across the river into the city from the reservoir, depending upon the size of the pipe?

A. O, yes, the friction varies with the length. If you
594 decrease the length of your pipe—if you put your suction right on the other side of the river, and turn up the river to the point where you are, if you keep the same length of pipe, you would have the same discharge. If you decrease the length you increase the discharge.

Q. When you have a pump you can overcome that friction loss by your suction, from the pump, can't you?

A. You can overcome that proportion of it.

Q. It tends to overcome it?

A. It tends to decrease it.

Court here took a recess until the next day.

WEDNESDAY MORNING, *March* 2, 1904.

Court met pursuant to recess and the hearing was resumed.

Examination of B. M. HALL resumed by Mr. WIMBERLY:

Q. You gave some opinions yesterday as to the incrustation of pipes and other things in the operation of municipal water works systems, have you ever yourself had charge of the practical operation of municipal water works?

A. No.

Q. Have you ever constructed any municipal water works system?

A. No. I have planned a great many of them. I have constructed a great many other works for mining works.

Q. Will you please tell us what cities you have planned
595 municipal systems for?

A. Planned for Dublin.

Q. Dublin, Georgia.

A. Dublin, Georgia. Made plans for Valdosta, for Elberton and might say for Columbus, in this investigation. I have made a great many investigations for Atlanta.

Q. Made investigations for Atlanta?

A. Yes.

Q. That right?

A. Yes, for the system—for their water supply.

Q. The plan that you speak of for Columbus, is the one that is embodied in this report here?

A. Yes.

Q. That has never been actually put into effect?

A. Never been carried out.

Q. Was the Elberton works built under your plans?

A. Has not been built yet.

Q. Has the Valdosta?

A. I think Valdosta has been built. I don't know whether it was built under my plans or not. I made plans for them.

Q. Has Dublin?

A. Dublin has been built under my plans.

Q. When was that?

A. Seven or eight years ago.

Q. You have never planned or constructed a water works system for a city as large as Columbus?

A. No. I have never just made a specialty of water works.
596 I have planned them and made examinations relative to them and in consultation.

Q. Take the Dublin works: What engineer actually constructed those works?

A. Moore and McCrary were the contractors.

Q. Did they have a supervising engineer?

A. Nothing but the City Council.

Q. Are they themselves engineers?

A. Well, I don't know that you could say they were engineers. They were smart enough to enforce the specifications.

Q. Have you been over to Dublin since to see how the system works?
A. Yes.
Q. How many hydrants have they over there?
A. I don't remember.
Q. Have they a pumping system over there or a gravity pressure?
A. Have a pumping system.
Q. Have they a filter plant?
A. Have artesian water and don't need any filter.
Q. You say they get their supply from an artesian well?
A. From an artesian well, yes.
Q. Do you remember what their system cost?
A. No, sir; I don't remember.
Q. Could you approximate it?
A. I made the estimates at the time. I think I could get it by going back to my books.

Objected to as irrelevant.

597 The MASTER: I think you can ask him generally about them but not go into the deails of them.

Mr. WIMBERLY: I want to compare the size of that system with the Columbus system.

Q. Can't you approximate it from memory, as the only system ever constructed under your plans? About what would be the cost?
A. Something in the neighborhood of $40,000., I think.
Q. Dublin has a population of something over 2000 people, hasn't it?
A. Yes, I think it would go over 3000, though I am not certain about that.
Q. You spoke of having made certain investigations for Atlanta: Have you ever made any details or plans for Atlanta upon which either their system or a part of their system has been constructed?
A. No, sir; I made investigations for them for a gravity system. Their system at present is a pumping system from the river—direct pumping.
Q. Was any construction due to the investigations you made?
A. Not by that investigation. It was in full—every thing that could be done; and that was plans and investigations for bringing water from the mountains 60 miles distance and 100 miles distant different streams that could be brought by gravity; and plans for an alternative system for the one that was built.
Q. Going back to actual experience as distinct from theory: What you say about corrosion of water pipe—probable corrosion:
598 is that based upon any actual taking up and examination of the water pipes or simply upon theory, what you think is probable?
A. It is upon observation as an engineer of long experience. I have been a hydraulic engineer since about 1880; and——
Q. In the mining business you simply lay new pipe?

Mr. WIMBISH: Let him finish answering the question.
The MASTER: Is that the answer you desire to make?

WITNESS: I understood him to ask me what my experience had been in hydraulic engineering and I was going on to tell him—going on to tell him some actual constructions I had made in the management of water.

Mr. WIMBERLY: Of course if the witness wants to voluntarily state that all right. I thought he was through.

Q. In the hydraulics you speak of—as a hydraulic engineer in mining, have you ever taken up any pipes in mining?

A. Yes, taken up a great many pipes and moved them. We use pipes in one place and get through with them and move them to another place.

Q. Isn't it a matter that is generally recognized, except of course such accidental destruction as might happen from breaking, that these cast iron pipes are practically indestructible?

A. It is true that there are some cast iron pipes that don't corrode—that don't seem to corrode after long exposure and others that do. No fixed rule about it.

Q. Properly coated?

A. Coating is a thing that will come off. Nobody has ever
599 found out yet how to make cast iron that is absolutely proof against corrosion. Some will corrode and some will not, while they make come from the same factory and the same lot.

Q. The only way to tell whether it is corroded or not is by actual test, isn't it?

A. By taking it up and seeing whether it is corroded—looking at it. There might be a way, if you knew what the capacity of the pipe ought to be and it has not that capacity, you could assume that it was corroded or filled up to that extent, the difference in discharge.

Q. You could test it by taking up sections of it and seeing, couldn't you?

A. Yes.

Q. Where you have a system in a city like Columbus, where you are continually making connections in every part of the system and cutting out sections where these connections have to be put in, it can be readily seen whether the pipes have corroded or not?

A. Yes, whether those pipes you cut out are corroded.

Q. If those connections are made all over the city from time to time, that would indicate whether there was such corrosion?

A. Yes, find some of it if it was.

Q. If it was you could find some of it?

A. I think so.

Q. If the men who make these connections do not find it then it is not true?

A. It is not true where they looked, as to the connections—
600 owing to the extent of them. If they should make a dozen connections they might strike it every time where there was good pipe and yet not strike the others.

Q. In a city the size of Columbus, where the town is growing, where new persons are taking water and others taking their connections out according to the change in population, demand and taking

into consideration the needs of the city and that going on all over the city, in a live, active city——

The MASTER: Don't make your question argumentative.

Q. Where it goes through several years, it would be known whether as a system it was corroded?

A. If the same men did the work—same set of men doing the work throughout the system, they ought to know what condition the pipe was in.

Q. You saw that section I handed you yesterday?

A. Yes, I saw it.

Q. That was not corroded to any appreciable extent, was it?

A. Yes, a very decided coating on the inside. It shows a coating there of rust.

Q. In speaking of corroding, that's what you call corroded pipe?

A. Yes, there's rust in it—connected with it. There that's very thin.

Q. Would that amount of rust appreciably weaken the pipe?

A. No, not if it staid at that; but a piece of iron starting to rust it is liable to increase faster, after it gets into the

601 pipe.

Q. In a system as old as the one in Columbus and no greater amount of rust in it than that, you would not consider that it was rusting very fast?

A. How old did you say that piece of pipe is?

Q. Twenty odd years, I think.

Mr. MARTIN: There is no evidence as to how old that particular pipe is.

WITNESS: I think the pipe shows a good state of preservation for the time it has been in.

Q. Oxide of iron in such slight quantities as would get in water from that sort of corrosion, is not poisonous, is it?

A. No, oxide of iron is not poisonous.

Q. In any quantities?

A. No, it is iron in the water. It is objectionable in a great many cases, chemically.

Q. It might chemically act?

A. On certain things; but so far as——

Q. But so far as the poison is concerned there is no poison about it?

A. Nothing harmful about it.

Q. Frequently in mineral springs?

A. The fact that iron is in them is considered an advantage.

Q. If there was mud that had accumulated in any part of the system, such as you stated would be possible at dead ends yesterday, if it had accumulated to such an extent as to affect the water, that could be determined, couldn't it by the odor and the appear-

602 ance of the water and by testing it?

A. Could by taking up the main and examining it.

Q. I mean if it were such as to appreciably affect the water you

were to take that same water that came through that same pipe, couldn't you tell by its appearance, or by subjecting——

A. Yes, owing to the velocity at which it comes through there. If it has settled in a very low velocity, if you keep that same velocity it would flow over it like mud in a branch or sand, in the bottom of it. If you should open up a hydrant very suddenly on a dead end, or one of these places, it would come out muddy water, if the mud had accumulated in it to any extent.

Q. Mud accumulates more next to a hydrant and at other angles and openings on account of the fact that as it passes one of these places, there is a little recess tha- is not the main current of the pipe?

A. Yes, there would be a tendency to deposit anywhere where the current is slowed down. If there is more capacity the current would not have to be as swift.

Q. If mud had accumulated, you would possibly find it at hydrants?

A. Well, I don't know that you would any more than you would at any other connection.

Q. I mean by connections, every connection for consumers or water hydrant connections?

603 A. You have for every angle—every bend in the pipe, you have specials that you put in that is a little larger than the pipe; and the pipe is fitted in it. The object is to make the section, that is, pretty nearly uniform in these ends—easy curves. I don't know that there would be any more cause to apprehend that there would be than there would at any other bend in the pipe or any other place where a special had to be used.

Q. At a dead end the mud would accumulate at the end—there is where the current stops?

A. If you had muddy water and it gets in a dead end and stops or stands, tendency would be to settle there.

Q. At the extreme end of a dead end?

A. Whenever muddy water should get in there, if it stood perfectly still, the mud would settle out of it. Would be more apt to do it than if it was running water.

Q. If you were to draw water out of a hydrant at a dead end, if there was any mud deposited in the pipe, it would show itself in the muddiness of the water?

A. I think so, unless that mud was of the nature of what we call barnacles in the pipe. Sometimes it combines with the oxide of iron in such a way as to make a very hard lump that won't wash out and forms a barnacle—forms a lump, part mud and part iron rust mixed; and if it takes that form water flowing past it won't loosen it.

Q. You can loosen it by flushing it out?

604 A. Not when it assumes the character of a barnacle you could not. It begins to harden and makes a hard lump of clay and iron ore. A large amount of clay and iron rust mixed together, that makes a hard incrustation and forms what is called a barnacle. Sometimes those things get very large and no amount of flushing will affect it at all.

Q. Ordinarily, leaving out extraordinary conditions, the flushing

of the water at the end of one of these dead ends, would clear it of any mud, wouldn't it?

A. Clear out any loose mud.

Q. Mr. Wimbish told me you had got certain figures I asked you for, that was, as to the quantity of water a pump would bring through a 12 inch main: Have you got those figures?

A. Yes, sir. The question as I understand it is, assuming that you can get 2,000,000 gallons a day from an open end in a main four miles long, one foot in diameter, coming from a reservoir under a 117 foot head, how much more could you get by relieving the pressure at the lower end, to the extent that it can be done with a pump suction. Practically I think the limit that could be applied in the way of pump suction there would be not over 20 feet additional head, which it would give by relieving it of the back pressure, unless that pipe itself was absolutely air tight, which is almost impossible to get in water pipe. A pipe that will hold water will frequently leak air. Taking 20 feet that would give—117 feet as it is and 20 feet more, would be 137 feet. The comparison
605 would be in proportion to the square roots of those heads. The square root of 117 is to the square root of 137 and as two million is to the result. And pumping the flow by putting a pumping suction on it would be 2,164,663 gallons per day or practically 1502 gallons per minute.

Q. To be sure that I get these figures correct: I understood that two million gallons is what you gave as the flow through a 12 inch pipe with 117 feet head, is that correct?

A. Two million gallons would be only 1495 per minute, is the estimated flow of a pipe 4 miles long, straight, smooth and cylindrical and under a head of 117 feet.

Q. 1495?

A. 1495; but I thought that there would not—it would be very probably that there would not be anything like that in a pipe that has been laid as long as that has.

Q. That is, if there are no barnacles or obstructions, anything of that sort?

A. I would not expect that pipe to meet that calculation.

Q. The condition of the pipe is a matter that be best determined by an actual examination of the pipe itself?

A. I don't know. You might find out or determine it by finding out how much water it will bring under 117 foot head and compare it with what it ought to bring and compare the estimate.—rather form an estimate.

Q. That can be determined by an actual test?

606 A. Can be determined by that kind of a test or it can be determined by taking it up and examining it.

Q. Either test would be an accurate test?

A. Yes.

Q. On that point, 1495 gallons per minute flow, that is based upon due allowance for friction loss from the reservoir a distance of four miles?

A. Friction in a smooth pipe of uniform 12 inches.

A. Right at the reservoir it would be greater than that: I mean to say right at the draught—of course if it had to go the whole distance it could not flow any faster at one end than at the other; but if it was opened right at the reservoir, if there was a short pipe of this size right at the reservoir?

A. Yes, you take the element of distance—friction is so much per 100 feet. If it amounted to a loss of head of one foot to the 100 feet, it would not lose but one foot in 100 feet; and it is so much according to the distance.

Q. Could you say how much that would be, without stopping—how much that flow would be without—how much that flow would be eliminating the element of distance, as to what the loss is going four miles?

A. Flow through a 12 inch pipe, have to get how much head?

Q. I mean with the same head, 117 feet?

A. Could not get it. Have to have pipe at least 117 feet long. Dig a hole in the ground or a tunnel from there here to do it. You would have to derive a level from the river or from the level of the town with that out there and come directly in.

607 Q. I want to know in figures what the actual loss is, on account of the distance it went, what it would be if you eliminated the friction. I don't think you understood my question?

A. If you were to bring the reservoir here?

Q. Or bring the engine to the reservoir, which would be the same thing, with a sufficient powerful pump?

A. I don't understand: You mean put the pump out there.

Q. Suppose you put a pumping station right at the reservoir?

A. Well, that would be a question of how much water you could get. That is the question you ask: I can answer it: I can figure it out and if it is answered it will not answer the other question: Still be friction in that pipe and a great deal of it.

Q. I will ask you the first one, please sir, and get you to answer that: Eliminating the friction entirely: I want to get at the element of friction loss: I want to get at what the friction loss is with that amount of head through four miles of 12 inch pipe?

A. If you will allow me I will answer it in a little table in order to explain. This is figured out at how much water would come out at the bottom of a tank 117 feet high with a hole 12 inches in diameter in it. No friction at all and then eliminating the friction. There would be considerable friction in that hole. I will state as a matter of fact——

Q. (Interrupting.) Can't you eliminate that by calculation?

608 A. That is owing to what kind of a hole you have, how thick the plank is or how thin it is and what shape it is.

Q. Of course I mean an open circle?

A. If you want to take the water without the friction, take the theoretical discharge from that: Theoretical discharge due to the head, it would give a velocity of 87 feet per second; and the area of that radius would be 78/100ths of a square foot. It would make it round numbers 67 cubic feet of water per second that would come

out of that and multiply it by 60 makes 420 cubic feet per minute. There is 7½ gallons in a cubic foot and multiply that by 7½ would give 29150 gallons per minute.

Q. That's actual discharge?

A. No, sir; that's theoretical discharge.

Q. Take the actual friction as it would be going the other way, one length of pipe—just a short length of pipe, enough to give you an orderly stream, I mean, of course if it came out with a rush you would lose part or the whole benefit of the size of the hole by the raggedness of the stream: But suppose you were to have a pipe just far enough to give an orderly direction to it, 10 or 20 feet, how much of that would be actually lost, if any?

A. As a rule, in planning anything of that kind, you start with a conically shaped pipe—start with a pipe with a large opening from the tank and come out and reduce it.

Q. Assuming now that that is of the proper kind of con-
609 struction and appliances at the start, how much of it would be available?

A. There are various kinds of openings—different devices. You can get, practically, an opening that will give you about 80 per cent.

The MASTER: To get the practical discharge you take off 20 per cent. of it?

A. Yes, sir.

(By Mr. WIMBERLY:)

Q. As I understand it, you mean to say, that flow of 23,000 gallons in a short pipe, is reduced to 1495 gallons in going 4 miles, more than 9/10ths?

A. Let me figure this out first and I will answer you. 23,320 gallons would be, might say, the most water you could get from a tank with a 12 inch opening, properly arranged, so as to make the best opening. The best discharge you could get.

Q. Now I understand, Mr. Hall, that 23,320 gallons is the quantity which would come through a 12 inch opening, with a proper conical device—approved modern methods to reduce friction, would be reduced by having to traverse four miles, same sort of pipe, from 23,320 gallons to 1495 gallons, more than 9/10ths?

A. Yes, if there is no mistake in the calculation and I don't think there is.

Q. Would it take you long to figure what is the frictional loss per mile in 12 inch pipe?

A. Not very long. I have a table right here before me that I know is correct as to the theoretical velocities that can be had
610 from these heads. I can figure it out from one of them and do figure it out very frequently off hand; but it would take time. With a head of 100 feet, according to this table, there would be a theoretical velocity of 80 feet coming out at the bottom of the tank. There would be a theoretical velocity for 125 foot head of 89-7/10ths feet. Now then for 117 foot head, say there would be 87 feet per second; velocity, theoretical 87 feet per second; and you

multiply that by 78/100ths and it gives 67 feet, that is, cubic feet per second; and multiply that by 60 and it gives 4020 cubic feet per minute; and 7½ gallons in a cubic foot of water; and multiply it by that and that gives 29150 and 80 per cent. of that would give 23,320.

Q. The difference is the loss?

A. The difference would be the loss in friction on that 4 miles of pipe, as a matter of fact.

Q. I understand you to say then that there has been a friction loss in traversing four miles of 12 inch, smooth, straight pipe, the difference between 23,320 gallons and 1495 gallons.

A. Yes. To illustrate the principle: If you had to take a heavy loaded wagon up a hill, you can not pull it up with the same effort that you could push it off a high precipice down to the bottom. It would take power to pull it up. It takes power to put water through pipe. If it has no resistence at all, a very large quantity of water can go through the hole. With resistence it takes power of
611 the head to push the water through it.

Q. Is the loss by resistence so much per mile: is it greater the first mile than it is the second?

A. It depends upon the size of the pipe and the velocity.

Q. I mean the same velocity and same pipe?

A. So much per 100 feet.

Q. Then eight miles would be twice as much loss as for four miles?

A. It would.

Q. So if it loses over nine tenths of its efficiency in four miles, it would lose—if it loses over nine tenths from 23,000 gallons down to 1495 gallons in four miles, the loss each and every mile you carried it—if you had to carry it eight miles it would lose 18/10ths—twice nine?

A. Yes; but the customary way to figure it out is so much per 100 feet. It is also customary to figure head so much per 100 feet. Will say this occurred with 117 feet head in four miles distance. If you cut that pipe off, you have not got 117 feet where you cut it off.

Q. I am speaking about this particular head?

A. You spoke of losing: If you cut it off at the reservoir ten feet outside, it won't flow that amount of water, not 23,000 gallons.

Q. Say you have a stand pipe—Rose Hill standpipe or any other standpipe that is 117 feet high, as I understand it, if you had no friction loss from pipe, you would get a flow out of that size
612 opening of 23,000 gallons per minute: Now I understand it loses the same for each mile you carry it, same for the first mile and the same for the second?

A. If you keep the same velocity.

Q. So if you go four miles it loses nine tenths, if you were to go eight miles, how much would it lose?

A. If you go eight miles, you can't get the same velocity, under that head, as you get in four miles. Cuts off your velocity. That's

what it does in this case, cuts off the velocity. That's where it loses water, cuts off your velocity.

Q. Wouldn't it be possible by starting it with enough initial pressure to get less higher velocity through eight miles of pipe—is it physically impossible to get this high velocity through that eight miles of pipe?

A. You can get the velocity; but every pipe has its limit at which you can get a certain amount of water through it. If you wanted to get 1495 gallons through a pipe eight miles long, then you would have to subject it to conditions that would allow a friction head of a certain amount—be so much per 100 feet—and in getting this you would have to give enough head to produce a friction head for that in order to give that flow. I think possibly I might have those things tabulated. I don't know; but I think I have.

The MASTER: I can't permit you to go into any more calculations while the witness is on the stand.

613 Q. I want to get at this Mr. Hall: As I understand from your answer, a pipe and a head sufficient to give a flow, at the reservoir, of 23,000 gallons per minute.

A. You mean now the reservoir?

Q. Right at the foot of the reservoir?

A. You mean 117 feet below the reservoir?

Q. Below the top of the reservoir: the surface of the reservoir is 117 feet higher than the place where the pipe takes the water out. As I understand it, in going four miles, with 23,320 gallons per minute, it has a friction loss, which brings it down to 1495 gallons, is that right?

A. That is right; but that is not a correct statement of the facts.

Q. What is correct?

A. Correct statement of facts, that if the water has to come through four miles of pipe—12 inch pipe, with the friction head itself, would make a certain discharge. If that water has to come through only a few feet of pipe, the friction head would not be so great. Now the friction head is the amount of power that it takes—amount of head that it takes to push a given amount of water through four miles of pipe; and you figure that out. In figuring that out you want the velocity of the water as it issues from that pipe; and after you get the velocity you multiply it by the cross-section of the pipe and get the amount. Velocity is equal to "M" constant or to the square roots of this. You can put it down, if you like. V equals M.

614 Q. What is M?

A. M is a constant. D. is the diameter in feet and H is the head in feet. D. H. Is the diameter multiplied by the head.

Q. What is L?

A. L is the length of the pipe in feet.

Q. What is M.

A. M has a value according to the value of that radical. After you work out the value of that radical, then it is the value for the

same size of pipe that has been determined by experiment. I will give you those values: 4, 6, 8, 10 and 12 inch pipe. That varies, you understand. You have to work out that D. H. divided by L. plus 54 D in each case and take the square root of it. That fraction is a very small fraction, amounting to the decimal 5/1000th. Then for one foot of pipe M would be equal to 35.

Q. Why can't you give it to me upon these tables, showing the value of M for each size of pipe?

A. You have to work out the value of this radical in each case.

Q. That determines the value of M?

A. The size of the pipe determines the value of M.

Q. M is not constant?

A. It is a variable constant. That is a constant for certain conditions; and when you have those conditions it is a constant.

Q. Hasn't that been calculated so as to save time, by persons who use those tables, for the different sizes of pipe, the value of M?

A. I have no such table as that.

615 Q. You have no such table?

A. I have worked out these things.

Q. They do have such tables, don't they?

A. Have had tables for ordinary cases. I have it right here for ordinary cases, up to a certain velocity.

Q. If you are going to work that how are you to get the value of M at all?

A. You get the value of M—there is a little table that you refer to for those values, which have been determined by experiment. If you will work out one of those I will show you just how.

The MASTER: I make this suggestion: at the Noon recess you work out these problems.

The counsel for respondent contended that while witness Hall was put up as an expert, that the counsel for the complainants had no right to call on him for the calculations called for. * * *

WITNESS: I will get a copy of it at Noon and give it to you, in order to save time. I can give you the principle upon which those things rest in a very few words without going into the calculations.

The MASTER: Have you got what you want?

Mr. WIMBERLY: No, sir; I have not got what I want. What I want to get at is this: the table or the data and I can work it myself. I want to get the friction loss by velocity due to 100 feet head, through 100 feet of four inch pipe; and then one mile of four inch pipe; and I want also the friction loss for 100 feet of

616 head of say six inch pipe; also one mile of six inch pipe; and also to get it per mile, by which I can get it for different distances. Then I want the friction loss by velocity due to 100 feet of head through 100 feet of eight inch pipe; and also one mile of 8 inch pipe. I can take the 100 feet and one mile and that will give me the proportion; and the same thing for 10 inch and 12 inch pipe. I want in addition to that one other thing: I want to get at how that would vary, the proportion by which it would vary as you would go up and down. Say it would be 200. If I can get a comparison for

A. It would be in proportion to the surface in contact and we can figure that out.

Q. Have you not that in your table?

A. I don't think I have. I don't think I could turn to it if I have. In a six inch pipe it would be practically 3 1/7 multiplied by six inches.

Q. And four inches what is it?

A. That would be four multiplied by 3 1/7th.

Q. One would be six multiplied by 3 1/7th?

A. Yes, and the other would be 4 multiplied by 3 1/7th. What would that make?

Q. 12 4/7s?

A. Take two of them?

585 Q. Would be twenty four and four sevenths?

A. While the other one is——

Q. Is 18 and six sevenths. One would be nearly one and a half times as much as the other larger pipe—save about one fourth?

A. Yes. There would be less friction for the same amount of water.

Q. About one fourth less friction?

A. Under the same velocity would be less.

Q. The larger pipe——

A. The larger pipe would be in proportion, that is, the friction in the larger pipe would be in proportion to the friction in the smaller pipe—would be about as 18 is to 28.

Q. That is to say about three fourths as great?

A. Yes.

Q. These two figures, both delivering the same quantity of water?

A. Yes, take in proportion to the surface in contact.

Q. So that the great thing to be avoided to save loss of pressure, the main element is high velocity and long distance through small pipes?

A. That's right.

Q. Now I will ask you this now about the pressure due to hydrostatic—I mean hydrostatic pressure due to a head of 210 feet, with a pumping system with sufficiently powerful pumps, you could reenforce that pressure so as to get more than due to the hydrostatic head, could you not?

586 A. At some points on your system you could. It would not be very good practice to do it. It would be dangerous.

Q. That would depend upon how well your system was constructed for distributing it out?

A. Yes. Depend very largely upon it.

Q. It would be dangerous if you were to try to force through one six inch pipe the high pressure that you would through a 12 inch pipe; and you would not go as high on a still weaker part: If you were to have such a distributing system as to have a sufficient quantity of pipes leading from your pumping station down to where it leads out for distribution, so as to take care of pressure at remote portions of the system as fast as your pumps pumped it in, you could

by direct pressure get higher results than from 210 feet, couldn't you?

A. Yes, you could; because you would have velocity going the other way in that portion towards the standpipe up on the hill.

Q. You spoke of course of its being dangerous: unless there is proper provision for taking care of it that would be true in a very high gravity system?

A. Yes, more in a high gravity system than any other, as you have got your limit and you can't go beyond that.

Q. And using your engines, you have got to watch your gauge and not go beyond the strength of your pipes?

A. Yes, sir.

Q. You could not take the down town gauge and rely on that and not follow the gauge close to your engine unless you
587 were sure your distribution system was sufficiently perfect to give as much pressure down town as you had close to your engine?

A. I think that's about the proper statement.

Q. In fact all danger can be provided against by a system of valves that blow off at certain points?

A. Yes, have regulating valves at your pump that will cut off the steam when it gets up to a certain quantity.

Q. There are devices in common use by which that is done automatically?

A. Yes, that's right.

Q. In fact all engines, as a matter of fact have those devices as a general rule?

A. As a general rule a pumping engine is supplied with that kind of a device, where it is intended to pump directly into the mains.

Q. Now taking up this particular system here: All these figures are arrived at, loss of pressure with different velocities, by actual experimental tests?

A. Yes, experimental tests for the purpose of making rules for them; and those rules, having worked it out, are based on actual tests of the pipe to find out what they would do under certain conditions.

Q. Now take this system that we have got: In order to deliver water at the portions of the city I have asked about, with approximately the pressure due to the head, it would be necessary to have a sufficient number of pipes of sufficient size so as to have no very high velocities, to get a sufficient quantity of water down
588 to keep that pipe always full, isn't that right?

The MASTER: You mean the lower part of the city?

Mr. WIMBERLY: Yes, sir.

WITNESS: It will always keep full if you don't let it out. If you keep a heavy draught on it you will let out at the lower end as much as it is going to take to keep it full.

Q. What I mean by keeping full, in order to have an equivalent, you take 450 feet which is probably your standard: If the pipe that leads into that is either too small or is tapped in too many places

before it gets there for the quantity of water to be insufficient, the pressure drops down before it would reach that four inch pipe?

A. Yes.

Q. Now then: just take this system as it stands: Isn't it best to calculate and knowing the size of your pumps and their capacity, and knowing the number of pipes leading down from there to any given portion of the city, the supply of water that will be carried will be divided out between the length of each and the size of each, to calculate accurately how much the friction loss would be?

A. It is possible.

Q. In going that distance?

A. Yes, it is possible to estimate it. You have got to take into consideration all those points—all those angles you have there, and other obstructions that may be in the pipes. It is best to adopt the system that is in vogue—that is in use by other cities
589 that has been found to be adequate.

Q. No two cities have identically the same system?

A. Not identically the same systems but they have the same principles.

Q. That man that applies it he works it out on mathematical principles?

A. So as not to have any four inch pipe in the system.

Q. That was not the question I asked you?

A. I thought I would get at that answer as quickly as possible.

The counsel for complainant objected to the witness volunteering testimony; and stated that the answer given by the witness was not in answer to the question asked; and stated to the court that the witness' manner of testifying was improper.

Objection overruled.

WITNESS: I have a defense to make to that answer.

Q. Answer the last question that I asked you, whether it is a fact that these things are calculated?

A. I will make my answer this way: that they are calculated on mathematical principles; and those mathematical principles are based on actual experiments—actual experience; and that actual experience shows that a four inch pipe is too small to use anywhere in a system of mains intended for fire pressure. When you ask a question recollect that I am going to leave out four inch pipe.

Q. It will run through your testimony?

590 A. I will qualify it by saying that a four inch pipe is not big enough.

Q. If you want to put that into each question why of course you can do it without its being repeated?

A. I would not want to be understood as saying that a four inch pipe is big enough.

Q. Isn't it just a matter of mathematical calculation as to how much water a 12 inch pipe will deliver under certain conditions?

A. Yes, based on experiments as to what it will do.

Q. Those experiments have developed certain rules?

A. Yes, sir.

Q. And with those rules you can give certain specific answers?

A. That's true.

Q. Take a 12 inch supply main leading from the reservoir to the pumping station, you gave in your figures here this morning what the capacity of a 12 inch main was with a head, I believe such as you stated, 92 feet I think it was?

A. 117 feet.

Q. And that was approximately 2,000,000 gallons?

A. That's right.

Q. Now then, suppose instead of its coming through that pipe, with nothing to push it or drive it through except the hydrostatic head—nothing except the head of 117 feet, that instead of that, you were to have at this end, drawing it through the pipe, pumps of a capacity of 2000 gallons per minute—I mean by their ca-
591 pacity, capacity right at the pump, and of course such loss as would be due to the pipes, not being big enough to supply the pumps, if that was the case, would those pumps bring more water or less water throug- a 12 inch main than the 117 feet head you speak of in your report?

A. They would increase the head, that is, they would decrease the pressure on the end through which it flowed; and have the effect of making greater flow. It would be limited to what you could get from suction, which is something, in the best cases about 28 feet. That is in absolutely air tight pipe.

Q. That is, the amount due to the height, the difference in height between the head of the reservoir and the place where it is delivered at the pumps, would be increased by the amount due to suction?

A. Yes, you would take the back pressure off—the back pressure of the atmosphere, which is about 15 pounds to the square inch.

Q. Suction removes that?

A. In water tight pipe,—I mean air tight pipe. If the pipe is not air tight, leaks or something, it removes a portion of it of course; but if it can get air it won't do it. If the pipe is air tigh it will remove the full air pressure.

Q. Atmospheric pressure is equivalent to about 34 feet?

A. About 15 pounds.

Q. 14 7/10ths pounds or 34 feet of water column?

592 A. Thirty four or thirty two, in that neighborhood, or 33 feet—15 pounds. That is about sea level—about the pressure ordinarily speaking.

Q. You say that is the limit?

A. That's the limit. The same principle. It is a simple proposition as to how high you can suck water with a pump. If you have suction in a well 20 or 30 feet long, you can't suck water up out of a well if you were to put the pump 50 feet above it.

Q. That's true if you pull it up. Suppose you are below the surface of the water, can you increase your suction greater than atmospheric pressure?

A. No, you only remove what would be back pressure of the atmosphere against it in flowing out. That's the limit of what you

can do if your pipe is air tight. If your pipe is not air tight, you might get 50 or 75 per cent. of it, that many pounds off of it.

Q. If you are lifting the water up after you raise it 34 feet and no higher, the distance left is a vacuum?

A. Yes.

Q. If the place where your pump is is lower than the level of the water and your pump is powerful enough to keep on pulling, after you remove the atmospheric pressure, you don't get any vacuum as long as you are pulling or lifting the water?

A. If you are below the level of the water, after you get the water into your pump and it goes beyond the pump into the discharge, then it becomes a different kind of pressure. It is direct
593 pressure from the pump and that depends upon the strength of the pump and the amount of steam you can put behind the piston.

Q. Take the actual conditions—say, of course, that you have got an air-tight pipe, what would the flow through a 12 inch pipe amount to, if it is drawn throug- by pumping?

A. I have figured it out for 117 feet.

Q. How much would that be increased by an additional 30 or 34 feet, whatever it was?

A. I don't think, in a practical way, you could have that pipe air tight. I don't think four miles of one foot pipe could be practically air tight, because a little bit of a leak makes a big difference. You might say add 30 feet to that. I don't think it is probable you would add more than 20 feet.

Q. Speaking of quantity of water, how much per day would it add, in quantity of water?

A. You would add in proportion to the head—the extra head you would get there.

Q. As 20 feet is to 117 you would add that much?

A. I think that would be about the proportion. If you were to take 2,000,000 gallons and the head is say 117 feet and the other head say would be 20 feet more, which would be 137, now that would be in proportion to the square root of 117——

Q. (Interrupting.) If you depended upon a gravity system there would be some loss in the pipe, say across the river, coming across the river into the city from the reservoir, depending upon the size of the pipe?

A. O, yes, the friction varies with the length. If you
594 decrease the length of your pipe—if you put your suction right on the other side of the river, and turn up the river to the point where you are, if you keep the same length of pipe, you would have the same discharge. If you decrease the length you increase the discharge.

Q. When you have a pump you can overcome that friction loss by your suction, from the pump, can't you?

A. You can overcome that proportion of it.

Q. It tends to overcome it?

A. It tends to decrease it.

Court here took a recess until the next day.

WEDNESDAY MORNING, *March* 2, 1904.

Court met pursuant to recess and the hearing was resumed.

Examination of B. M. HALL resumed by Mr. WIMBERLY:

Q. You gave some opinions yesterday as to the incrustation of pipes and other things in the operation of municipal water works systems, have you ever yourself had charge of the practical operation of municipal water works?

A. No.

Q. Have you ever constructed any municipal water works system?

A. No. I have planned a great many of them. I have constructed a great many other works for mining works.

Q. Will you please tell us what cities you have planned
595 municipal systems for?

A. Planned for Dublin.

Q. Dublin, Georgia.

A. Dublin, Georgia. Made plans for Valdosta, for Elberton and might say for Columbus, in this investigation. I have made a great many investigations for Atlanta.

Q. Made investigations for Atlanta?

A. Yes.

Q. That right?

A. Yes, for the system—for their water supply.

Q. The plan that you speak of for Columbus, is the one that is embodied in this report here?

A. Yes.

Q. That has never been actually put into effect?

A. Never been carried out.

Q. Was the Elberton works built under your plans?

A. Has not been built yet.

Q. Has the Valdosta?

A. I think Valdosta has been built. I don't know whether it was built under my plans or not. I made plans for them.

Q. Has Dublin?

A. Dublin has been built under my plans.

Q. When was that?

A. Seven or eight years ago.

Q. You have never planned or constructed a water works system for a city as large as Columbus?

A. No, I have never just made a specialty of water works.
596 I have planned them and made examinations relative to them and in consultation.

Q. Take the Dublin works: What engineer actually constructed those works?

A. Moore and McCrary were the contractors.

Q. Did they have a supervising engineer?

A. Nothing but the City Council.

Q. Are they themselves engineers?

A. Well, I don't know that you could say they were engineers. They were smart enough to enforce the specifications.

Q. Have you been over to Dublin since to see how the system works?

A. Yes.

Q. How many hydrants have they over there?

A. I don't remember.

Q. Have they a pumping system over there or a gravity pressure?

A. Have a pumping system.

Q. Have they a filter plant?

A. Have artesian water and don't need any filter.

Q. You say they get their supply from an artesian well?

A. From an artesian well, yes.

Q. Do you remember what their system cost?

A. No, sir; I don't remember.

Q. Could you approximate it?

A. I made the estimates at the time. I think I could get it by going back to my books.

Objected to as irrelevant.

597 The MASTER: I think you can ask him generally about them but not go into the deails of them.

Mr. WIMBERLY: I want to compare the size of that system with the Columbus system.

Q. Can't you approximate it from memory, as the only system ever constructed under your plans? About what would be the cost?

A. Something in the neighborhood of $40,000., I think.

Q. Dublin has a population of something over 2000 people, hasn't it?

A. Yes, I think it would go over 3000, though I am not certain about that.

Q. You spoke of having made certain investigations for Atlanta. Have you ever made any details or plans for Atlanta upon which either their system or a part of their system has been constructed?

A. No, sir; I made investigations for them for a gravity system. Their system at present is a pumping system from the river—direct pumping.

Q. Was any construction due to the investigations you made?

A. Not by that investigation. It was in full—every thing that could be done; and that was plans and investigations for bringing water from the mountains 60 miles distance and 100 miles distant, different streams that could be brought by gravity; and plans for an alternative system for the one that was built.

Q. Going back to actual experience as distinct from theory: What you say about corrosion of water pipe—probable corrosion:

598 is that based upon any actual taking up and examination of the water pipes or simply upon theory, what you think is probable?

A. It is upon observation as an engineer of long experience. I have been a hydraulic engineer since about 1880; and——

Q. In the mining business you simply lay new pipe?

Mr. WIMBISH: Let him finish answering the question.

The MASTER: Is that the answer you desire to make?

WITNESS: I understood him to ask me what my experience had been in hydraulic engineering and I was going on to tell him—going on to tell him some actual constructions I had made in the management of water.

Mr. WIMBERLY: Of course if the witness wants to voluntarily state that all right. I thought he was through.

Q. In the hydraulics you speak of—as a hydraulic engineer in mining, have you ever taken up any pipes in mining?

A. Yes, taken up a great many pipes and moved them. We use pipes in one place and get through with them and move them to another place.

Q. Isn't it a matter that is generally recognized, except of course such accidental destruction as might happen from breaking, that these cast iron pipes are practically indestructible?

A. It is true that there are some cast iron pipes that don't corrode—that don't seem to corrode after long exposure and others that do. No fixed rule about it.

Q. Properly coated?

A. Coating is a thing that will come off. Nobody has ever
599 found out yet how to make cast iron that is absolutely proof against corrosion. Some will corrode and some will not, while they make come from the same factory and the same lot.

Q. The only way to tell whether it is corroded or not is by actual test, isn't it?

A. By taking it up and seeing whether it is corroded—looking at it. There might be a way, if you knew what the capacity of the pipe ought to be and it has not that capacity, you could assume that it was corroded or filled up to that extent, the difference in discharge.

Q. You could test it by taking up sections of it and seeing, couldn't you?

A. Yes.

Q. Where you have a system in a city like Columbus, where you are continually making connections in every part of the system and cutting out sections where these connections have to be put in, it can be readily seen whether the pipes have corroded or not?

A. Yes, whether those pipes you cut out are corroded.

Q. If those connections are made all over the city from time to time, that would indicate whether there was such corrosion?

A. Yes, find some of it if it was.

Q. If it was you could find some of it?

A. I think so.

Q. If the men who make these connections do not find it then it is not true?

A. It is not true where they looked, as to the connections—
600 owing to the extent of them. If they should make a dozen connections they might strike it every time where there was good pipe and yet not strike the others.

Q. In a city the size of Columbus, where the town is growing, where new persons are taking water and others taking their connections out according to the change in population, demand and taking

into consideration the needs of the city and that going on all over the city, in a live, active city——

The MASTER: Don't make your question argumentative.

Q. Where it goes through several years, it would be known whether as a system it was corroded?

A. If the same men did the work—same set of men doing the work throughout the system, they ought to know what condition the pipe was in.

Q. You saw that section I handed you yesterday?

A. Yes, I saw it.

Q. That was not corroded to any appreciable extent, was it?

A. Yes, a very decided coating on the inside. It shows a coating there of rust.

Q. In speaking of corroding, that's what you call corroded pipe?

A. Yes, there's rust in it—connected with it. There that's very thin.

Q. Would that amount of rust appreciably weaken the pipe?

A. No, not if it staid at that; but a piece of iron starting to rust it is liable to increase faster, after it gets into the
601 pipe.

Q. In a system as old as the one in Columbus and no greater amount of rust in it than that, you would not consider that it was rusting very fast?

A. How old did you say that piece of pipe is?

Q. Twenty odd years, I think.

Mr. MARTIN: There is no evidence as to how old that particular pipe is.

WITNESS: I think the pipe shows a good state of preservation for the time it has been in.

Q. Oxide of iron in such slight quantities as would get in water from that sort of corrosion, is not poisonous, is it?

A. No, oxide of iron is not poisonous.

Q. In any quantitties?

A. No, it is iron in the water. It is objectionable in a great many cases, chemically.

Q. It might chemically act?

A. On certain things; but so far as——

Q. But so far as the poison is concerned there is no poison about it?

A. Nothing harmful about it.

Q. Frequently in mineral springs?

A. The fact that iron is in them is considered an advantage.

Q. If there was mud that had accumulated in any part of the system, such as you stated would be possible at dead ends yesterday, if it had accumulated to such an extent as to affect the water, that could be determined, couldn't it by the odor and the appear-
602 ance of the water and by testing it?

A. Could by taking up the main and examining it.

Q. I mean if it were such as to appreciably affect the water you

were to take that same water that came through that same pipe, couldn't you tell by its appearance, or by subjecting——

A. Yes, owing to the velocity at which it comes through there. If it has settled in a very low velocity, if you keep that same velocity it would flow over it like mud in a branch or sand, in the bottom of it. If you should open up a hydrant very suddenly on a dead end, or one of these places, it would come out muddy water, if the mud had accumulated in it to any extent.

Q. Mud accumulates more next to a hydrant and at other angles and openings on account of the fact that as it passes one of these places, there is a little recess tha- is not the main current of the pipe?

A. Yes, there would be a tendency to deposit anywhere where the current is slowed down. If there is more capacity the current would not have to be as swift.

Q. If mud had accumulated, you would possibly find it at hydrants?

A. Well, I don't know that you would any more than you would at any other connection.

Q. I mean by connections, every connection for consumers or water hydrant connections?

603 A. You have for every angle—every bend in the pipe, you have specials that you put in that is a little larger than the pipe; and the pipe is fitted in it. The object is to make the section, that is, pretty nearly uniform in these ends—easy curves. I don't know that there would be any more cause to apprehend that there would be than there would at any other bend in the pipe or any other place where a special had to be used.

Q. At a dead end the mud would accumulate at the end—there is where the current stops?

A. If you had muddy water and it gets in a dead end and stops or stands, tendency would be to settle there.

Q. At the extreme end of a dead end?

A. Whenever muddy water should get in there, if it stood perfectly still, the mud would settle out of it. Would be more apt to do it than if it was running water.

Q. If you were to draw water out of a hydrant at a dead end, if there was any mud deposited in the pipe, it would show itself in the muddiness of the water?

A. I think so, unless that mud was of the nature of what we call barnacles in the pipe. Sometimes it combines with the oxide of iron in such a way as to make a very hard lump that won't wash out and forms a barnacle—forms a lump, part mud and part iron rust mixed; and if it takes that form water flowing past it won't loosen it.

Q. You can loosen it by flushing it out?

604 A. Not when it assumes the character of a barnacle you could not. It begins to harden and makes a hard lump of clay and iron ore. A large amount of clay and iron rust mixed together, that makes a hard incrustation and forms what is called a barnacle. Sometimes those things get very large and no amount of flushing will affect it at all.

Q. Ordinarily, leaving out extraordinary conditions, the flushing

of the water at the end of one of these dead ends, would clear it of any mud, wouldn't it?

A. Clear out any loose mud.

Q. Mr. Wimbish told me you had got certain figures I asked you for, that was, as to the quantity of water a pump would bring through a 12 inch main: Have you got those figures?

A. Yes, sir. The question as I understand it is, assuming that you can get 2,000,000 gallons a day from an open end in a main four miles long, one foot in diameter, coming from a reservoir under a 117 foot head, how much more could you get by relieving the pressure at the lower end, to the extent that it can be done with a pump suction. Practically I think the limit that could be applied in the way of pump suction there would be not over 20 feet additional head, which it would give by relieving it of the back pressure, unless that pipe itself was absolutely air tight, which is almost impossible to get in water pipe. A pipe that will hold water will frequently leak air. Taking 20 feet that would give—117 feet as it is and 20 feet more, would be 137 feet. The comparison
605 would be in proportion to the square roots of those heads. The square root of 117 is to the square root of 137 and as two million is to the result. And pumping the flow by putting a pumping suction on it would be 2,164,663 gallons per day or practically 1502 gallons per minute.

Q. To be sure that I get these figures correct: I understood that two million gallons is what you gave as the flow through a 12 inch pipe with 117 feet head, is that correct?

A. Two million gallons would be only 1495 per minute, is the estimated flow of a pipe 4 miles long, straight, smooth and cylindrical and under a head of 117 feet.

Q. 1495?

A. 1495; but I thought that there would not—it would be very probably that there would not be anything like that in a pipe that has been laid as long as that has.

Q. That is, if there are no barnacles or obstructions, anything of that sort?

A. I would not expect that pipe to meet that calculation.

Q. The condition of the pipe is a matter that be best determined by an actual examination of the pipe itself?

A. I don't know. You might find out or determine it by finding out how much water it will bring under 117 foot head and compare it with what it ought to bring and compare the estimate,—rather form an estimate.

Q. That can be determined by an actual test?

606 A. Can be determined by that kind of a test or it can be determined by taking it up and examining it.

Q. Either test would be an accurate test?

A. Yes.

Q. On that point, 1495 gallons per minute flow, that is based upon due allowance for friction loss from the reservoir a distance of four miles?

A. Friction in a smooth pipe of uniform 12 inches.

A. Right at the reservoir it would be greater than that: I mean, to say right at the draught—of course if it had to go the whole distance it could not flow any faster at one end than at the other; but if it was opened right at the reservoir, if there was a short pipe of this size right at the reservoir?

A. Yes, you take the element of distance—friction is so much per 100 feet. If it amounted to a loss of head of one foot to the 100 feet, it would not lose but one foot in 100 feet; and it is so much according to the distance.

Q. Could you say how much that would be, without stopping—how much that flow would be without—how much that flow would be eliminating the element of distance, as to what the loss is going four miles?

A. Flow through a 12 inch pipe, have to get how much head?

Q. I mean with the same head, 117 feet?

A. Could not get it. Have to have pipe at least 117 feet long. Dig a hole in the ground or a tunnel from there here to do it. You would have to derive a level from the river or from the level of the town with that out there and come directly in.

607 Q. I want to know in figures what the actual loss is, on account of the distance it went, what it would be if you eliminated the friction. I don't think you understood my question?

A. If you were to bring the reservoir here?

Q. Or bring the engine to the reservoir, which would be the same thing, with a sufficient powerful pump?

A. I don't understand: You mean put the pump out there.

Q. Suppose you put a pumping station right at the reservoir?

A. Well, that would be a question of how much water you could get. That is the question you ask: I can answer it: I can figure it out and if it is answered it will not answer the other question: Still be friction in that pipe and a great deal of it.

Q. I will ask you the first one, please sir, and get you to answer that: Eliminating the friction entirely: I want to get at the element of friction loss: I want to get at what the friction loss is with that amount of head through four miles of 12 inch pipe?

A. If you will allow me I will answer it in a little table in order to explain. This is figured out at how much water would come out at the bottom of a tank 117 feet high with a hole 12 inches in diameter in it. No friction at all and then eliminating the friction. There would be considerable friction in that hole. I will state as a matter of fact——

Q. (Interrupting.) Can't you eliminate that by calculation?

608 A. That is owing to what kind of a hole you have, how thick the plank is or how thin it is and what shape it is.

Q. Of course I mean an open circle?

A. If you want to take the water without the friction, take the theoretical discharge from that: Theoretical discharge due to the head, it would give a velocity of 87 feet per second; and the area of that radius would be 78/100ths of a square foot. It would make it round numbers 67 cubic feet of water per second that would come

out of that and multiply it by 60 makes 420 cubic feet per minute. There is 7½ gallons in a cubic foot and multiply that by 7½ would give 29150 gallons per minute.

Q. That's actual discharge?

A. No, sir; that's theoretical discharge.

Q. Take the actual friction as it would be going the other way, one length of pipe—just a short length of pipe, enough to give you an orderly stream, I mean, of course if it came out with a rush you would lose part or the whole benefit of the size of the hole by the raggedness of the stream: But suppose you were to have a pipe just far enough to give an orderly direction to it, 10 or 20 feet, how much of that would be actually lost, if any?

A. As a rule, in planning anything of that kind, you start with a conically shaped pipe—start with a pipe with a large opening from the tank and come out and reduce it.

Q. Assuming now that that is of the proper kind of con-
609 struction and appliances at the start, how much of it would be available?

A. There are various kinds of openings—different devices. You can get, practically, an opening that will give you about 80 per cent.

The MASTER: To get the practical discharge you take off 20 per cent. of it?

A. Yes, sir.

(By Mr. WIMBERLY:)

Q. As I understand it, you mean to say, that flow of 23,000 gallons in a short pipe, is reduced to 1495 gallons in going 4 miles, more than 9/10ths?

A. Let me figure this out first and I will answer you. 23,320 gallons would be, might say, the most water you could get from a tank with a 12 inch opening, properly arranged, so as to make the best opening. The best discharge you could get.

Q. Now I understand, Mr. Hall, that 23,320 gallons is the quantity which would come through a 12 inch opening, with a proper conical device—approved modern methods to reduce friction, would be reduced by having to traverse four miles, same sort of pipe, from 23,320 gallons to 1495 gallons, more than 9/10ths?

A. Yes, if there is no mistake in the calculation and I don't think there is.

Q. Would it take you long to figure what is the frictional loss per mile in 12 inch pipe?

A. Not very long. I have a table right here before me that I know is correct as to the theoretical velocities that can be had
610 from these heads. I can figure it out from one of them and do figure it out very frequently off hand; but it would take time. With a head of 100 feet, according to this table, there would be a theoretical velocity of 80 feet coming out at the bottom of the tank. There would be a theoretical velocity for 125 foot head of 89-7/10ths feet. Now then for 117 foot head, say there would be 87 feet per second; velocity, theoretical 87 feet per second; and you

multiply that by 78/100ths and it gives 67 feet, that is, cubic feet per second; and multiply that by 60 and it gives 4020 cubic feet per minute; and 7½ gallons in a cubic foot of water; and multiply it by that and that gives 29150 and 80 per cent. of that would give 23,320.

Q. The difference is the loss?

A. The difference would be the loss in friction on that 4 miles of pipe, as a matter of fact.

Q. I understand you to say then that there has been a friction loss in traversing four miles of 12 inch, smooth, straight pipe, the difference between 23,320 gallons and 1495 gallons.

A. Yes. To illustrate the principle: If you had to take a heavy loaded wagon up a hill, you can not pull it up with the same effort that you could push it off a high precipice down to the bottom. It would take power to pull it up. It takes power to put water through pipe. If it has no resistence at all, a very large quantity of water can go through the hole. With resistence it takes power of
611 the head to push the water through it.

Q. Is the loss by resistence so much per mile: is it greater the first mile than it is the second?

A. It depends upon the size of the pipe and the velocity.

Q. I mean the same velocity and same pipe?

A. So much per 100 feet.

Q. Then eight miles would be twice as much loss as for four miles?

A. It would.

Q. So if it loses over nine tenths of its efficiency in four miles, it would lose—if it loses over nine tenths from 23,000 gallons down to 1495 gallons in four miles, the loss each and every mile you carried it—if you had to carry it eight miles it would lose 18/10ths—twice nine?

A. Yes; but the customary way to figure it out is so much per 100 feet. It is also customary to figure head so much per 100 feet. Will say this occurred with 117 feet head in four miles distance. If you cut that pipe off, you have not got 117 feet where you cut it off.

Q. I am speaking about this particular head?

A. You spoke of losing: If you cut it off at the reservoir ten feet outside, it won't flow that amount of water, not 23,000 gallons.

Q. Say you have a stand pipe—Rose Hill standpipe or any other standpipe that is 117 feet high, as I understand it, if you had no friction loss from pipe, you would get a flow out of that size
612 opening of 23,000 gallons per minute: Now I understand it loses the same for each mile you carry it, same for the first mile and the same for the second?

A. If you keep the same velocity.

Q. So if you go four miles it loses nine tenths, if you were to go eight miles, how much would it lose?

A. If you go eight miles, you can't get the same velocity, under that head, as you get in four miles. Cuts off your velocity. That's

what it does in this case, cuts off the velocity. That's where it loses water, cuts off your velocity.

Q. Wouldn't it be possible by starting it with enough initial pressure to get less higher velocity through eight miles of pipe—is it physically impossible to get this high velocity through that eight miles of pipe?

A. You can get the velocity; but every pipe has its limit at which you can get a certain amount of water through it. If you wanted to get 1495 gallons through a pipe eight miles long, then you would have to subject it to conditions that would allow a friction head of a certain amount—be so much per 100 feet—and in getting this you would have to give enough head to produce a friction head for that in order to give that flow. I think possibly I might have those things tabulated. I don't know; but I think I have.

The MASTER: I can't permit you to go into any more calculations while the witness is on the stand.

613 Q. I want to get at this Mr. Hall: As I understand from your answer, a pipe and a head sufficient to give a flow, at the reservoir, of 23,000 gallons per minute.

A. You mean now the reservoir?

Q. Right at the foot of the reservoir?

A. You mean 117 feet below the reservoir?

Q. Below the top of the reservoir: the surface of the reservoir is 117 feet higher than the place where the pipe takes the water out. As I understand it, in going four miles, with 23,320 gallons per minute, it has a friction loss, which brings it down to 1495 gallons, is that right?

A. That is right; but that is not a correct statement of the facts.

Q. What is correct?

A. Correct statement of facts, that if the water has to come through four miles of pipe—12 inch pipe, with the friction head itself, would make a certain discharge. If that water has to come through only a few feet of pipe, the friction head would not be so great. Now the friction head is the amount of power that it takes—amount of head that it takes to push a given amount of water through four miles of pipe; and you figure that out. In figuring that out you want the velocity of the water as it issues from that pipe; and after you get the velocity you multiply it by the cross-section of the pipe and get the amount. Velocity is equal to "M" constant or to the square roots of this. You can put it down, if you like. V equals M.

614 Q. What is M?

A. M is a constant. D. is the diameter in feet and H is the head in feet. D. H. Is the diameter multiplied by the head.

Q. What is L?

A. L is the length of the pipe in feet.

Q. What is M.

A. M has a value according to the value of that radical. After you work out the value of that radical, then it is the value for the

same size of pipe that has been determined by experiment. I will give you those values: 4, 6, 8, 10 and 12 inch pipe. That varies, you understand. You have to work out that D. H. divided by L, plus 54 D in each case and take the square root of it. That fraction is a very small fraction, amounting to the decimal 5/1000th. Then for one foot of pipe M would be equal to 35.

Q. Why can't you give it to me upon these tables, showing the value of M for each size of pipe?

A. You have to work out the value of this radical in each case.

Q. That determines the value of M?

A. The size of the pipe determines the value of M.

Q. M is not constant?

A. It is a variable constant. That is a constant for certain conditions; and when you have those conditions it is a constant.

Q. Hasn't that been calculated so as to save time, by persons who use those tables, for the different sizes of pipe, the value of M?

A. I have no such table as that.

615 Q. You have no such table?

A. I have worked out these things.

Q. They do have such tables, don't they?

A. Have had tables for ordinary cases. I have it right here for ordinary cases, up to a certain velocity.

Q. If you are going to work that how are you to get the value of M at all?

A. You get the value of M—there is a little table that you refer to for those values, which have been determined by experiment. If you will work out one of those I will show you just how.

The MASTER: I make this suggestion: at the Noon recess you work out these problems.

The counsel for respondent contended that while witness Hall was put up as an expert, that the counsel for the complainants had no right to call on him for the calculations called for. * * *

WITNESS: I will get a copy of it at Noon and give it to you, in order to save time. I can give you the principle upon which those things rest in a very few words without going into the calculations.

The MASTER: Have you got what you want?

Mr. WIMBERLY: No, sir; I have not got what I want. What I want to get at is this: the table or the data and I can work it myself. I want to get the friction loss by velocity due to 100 feet head, through 100 feet of four inch pipe; and then one mile of four inch pipe; and I want also the friction loss for 100 feet of

616 head of say six inch pipe; also one mile of six inch pipe; and also to get it per mile, by which I can get it for different distances. Then I want the friction loss by velocity due to 100 feet of head through 100 feet of eight inch pipe; and also one mile of 8 inch pipe. I can take the 100 feet and one mile and that will give me the proportion; and the same thing for 10 inch and 12 inch pipe. I want in addition to that one other thing: I want to get at how that would vary, the proportion by which it would vary as you would go up and down. Say it would be 200. If I can get a comparison for

any other height, one hundred, 200 or per mile, by which I can go up and down as a basis.

A. I will state this per mile and let it meet every case.

Q. The source of supply, when you made this report, I believe I asked you yesterday, that you considered more in detail, worked out more fully, was Roaring Creek: Why did you select that creek?

A. Mainly because it had Standing Boy Creek right behind it and that could be poured into it.

Q. You looked around at the different water courses and you selected that as the one that you thought, under the circumstances was the best?

A. Because it had a large storage basin and because it had a large creek right behind it that can be turned into Standing Boy Creek. That's the main reason.

Q. How far is that Creek from Columbus, Standing Boy and Roaring Creek?

A. About four miles.

617 Q. How far is Standing Boy Creek from Roaring Creek?

A. It is probably a mile beyond the water shed of Roaring Creek; but to bring it or have a line of pipe or canal to bring it into that water shed it would take several miles of canal or pipe line to bring it in by gravity.

Q. That water shed is approximately the same in size as the Holland Creek water shed, isn't it?

A. Some larger.

Q. What I mean it is practically the same, no difference, 1/7th or 1/8th, something like that?

A. That big a space but the water shed of Roaring Creek is not depended on its own water shed like the Alabama water supply; for the reason that it has right behind it at a higher level a water supply that is over 15 square miles of drainage area, something like that, Standing Boy Creek in the rear, that can be brought into it.

Q. You figured though, without bringing in the Standing Boy, that the water shed of Roaring Creek was ample for a good long time to come?

A. I did too for Holland's Creek at the same time, of equal velocity, although it was in proportion to the water shed, one five million and the other six million.

Q. This plate I in your report gives the water shed of Holland's Creek and the present reservoir and the direction of the pipe line conveying the water into the City of Columbus; and also the water shed that you proposed to use for Roaring Creek and the proposed reservoir and the method by which you proposed to get that

618 water into the city, doesn't it?

A. It does.

Q. Now the water shed of Roaring Creek, on this side of the river, do you know how the protection of those streams compare—the contamination I mean to say,—the settled area compare, the number of houses, compare with the water shed of Holland's Creek—Did you make that comparison?

A. I did at the time, I think with this water shed; and my recollection is, so far as the houses right on the water shed, was about the same thing, although Holland's Creek water shed up beyond where it entered quite a settlement up on the upper portion, that is, in the background in there.

Q. Isn't there a settlement on this?

A. As to individual houses, no.

Q. Did you count the houses—did you compare the number of houses one side with the other?

A. I think I did. My recollection is that I reported in there that neither one was troubled with that—no trouble with their water shed. Standing Boy Creek up there was the main reason why I showed any leaning towards Roaring Creek reservoir to supply any deficiency of water, was the main reason why I leaned to that.

Q. Now I suppose in your report which you read yesterday you quoted the exact language, substantially, was, that the proposed water shed was substantially the same as Holland's Creek?

A. That was my report so far as the condition of the water sheds themselves were concerned, natural conditions, occupancy,
619 and so on.

Q. You spoke yesterday in your direct examination about filtering water: Did you ever yourself erect a filter plant?

A. Never did.

Q. In your line——

A. I have been very familiar with filter plants.

Q. In your actual work though, as a mining engineer and irrigating engineer, you don't come in contact with the matter of filtering water, do you?

A. Nothing—Never except for industrial purposes. There might occasionally be a case where it would be necessary to filter it for industrial purposes outside of supplying a city.

Q. You gave me a list of the different cities in which you more or less completely formed plans for water works systems, Valdosta, Elberton and this one for Columbus: In either of those systems did you include filters?

A. No, not in the original work. In the Dublin system there was no necessity for it. It was artesian water. In the Elberton system I proposed natural filtration by getting water from along the bottoms—wide bottom of a creek where there was gravel. We sunk wells into it and got natural filtered water.

Q. You mean water that had soaked through the ground?

A. Soaked through the ground—bottom land, through sand and gravel down to these places.

Q. How about Valdosta?

A. The Valdosta plant was for an artesian supply.

620 Q. And for Columbus you didn't include a filter—you stated that on yesterday?

A. I was depending upon sedimentation.

Q. So your direct line of work has not covered the subject of filtration of water?

A. Except in a general way. My direct line of work has been

nearly altogether in hydraulics and the use or flow of water in pipes and canals and the construction of plants connected with the use of water.

Q. You spoke of alum being used in filtration: Isn't it a fact that within the last few years the objectionable use of alum, that is, the leaving of an appreciable quantity of alum in the water have been eliminated by such improvements that now you get entirely rid of the alum?

A. No, that has not been done. The amount of alum used depends upon the turbidity of the water. If you get water with a constant turbidity, then you use a constant amount of alum. You can put in just enough alum to coagulate the solids in the water and all of it will be left in the filter and the water itself will contain no appreciable amount of alum. If you are using water that is pretty muddy one day and you are giving the proper supply of alum and next day that water is only half as muddy, you are apt to use too much alum. That is frequently done. Now the next day if your water is muddier you are apt to use too little and you will get some mud in your water. I can illustrate it by giving an exact example:

621 In Atlanta with the old water works we had no means of getting constant water. It would be muddy one week and clear the next week and consequently we were troubled. The old plant existed out on South River. When the new plant was put in we used river water. We have a reservoir there that will hold 190,000,000 gallons and is about fifty feet deep. We take water from the top of that and pump the water only at times when the river is not very muddy. We try not to put very muddy water in it; and as a consequence you get about the same kind of water all the time, and the filtration has not been any trouble since.

Q. You say there has been no trouble since: Isn't it a fact that only a few days ago, last Saturday, the muddiness of the water for several days in Atlanta, led to the city's having to take action about it—its citizens?

A. I am a citizen there and I use the water and I didn't know anything about it.

Q. You were there last week?

A. I was there, yes, I think I was there all last week. The papers are always making a fuss about different things happening there,—a sensation. The truth of the business is we have a little muddy water in the pipes once in awhile. Accidents will happen; but as a rule we have very good water.

Q. You would consider pumping muddy water from the river direct into the city for three days one of those little things that the newspapers——

A. I am of the opinion that they have never done it, or else I would have found out something about it.

Q. Didn't go into your part of the mains?

A. I didn't hear any complaint from my people.

622 Q. The present system of filtration in general use entirely eliminates the alum, doesn't it?

A. In using alum?

Q. Eliminates it from the water or the water as it comes out an analysis shows no trace of alum?

A. The intention is to do that.

Q. Doesn't actual results outside of an analysis show that is a fact?

A. I think not in all cases they have been put to, unless you have uniform water. If you have uniform water you can attain that.

Q. Do you think a chemist whose business is to examine waters would be in a better position to pass on that?

A. I think a chemist who has examined the water for all times and under all conditions he probably would be more competent; but the fact of the business is you have to put in the alum in proportion to the muddiness of your water. If your water is clearer than you calculate on when you put in your alum, you are going to get too much alum in your water and it is going all through your filter If 20 grains would arrest the turpidity and you put in 50 grains, the thirty grains would go on in the water.

Q. The slight variations in the quantity of alum you put in would be left in the water, if you should happen to get a greater proportion to the muddiness of the water?

A. Yes, that's my understanding of it.

Q. Is that based on direct observations?

A. Yes, based on direct observation a hydraulic engineer would have in a life time.

623 Q. If an actual test was made at any time and it showed no presence of alum, it would prove——

A. I would want a very good explanation of why it did not. Would not be satisfied without it.

Q. Isn't it a fact that since these investigations you speak of, there has been such an improvement in the method of putting alum in, that it is now entirely eliminated, and chemists, who examine the water, under the approved system, never find any alum in the water, whether they examine it on days when the water is muddy or other days.

A. I don't think that is true. It is my opinion it is not.

Q. You don't think there has been any substantial improvement in the matter of filtration of water in the last ten years?

A. I think there has been great improvement; but I think if you use alum for the purpose of arresting the turbidity, it has got to be in proportion to the turbidity. If the turbidity is slight and you use too much alum, it is going on through your filtered water; and it is possible to use too much alum.

Q I mean by accurately proportioning the two?

A. You are obliged to do it. You must accurately proportion it.

Q. How do you apply the alum?

A. It is applied in a solution. You let a certain amount run into the tank through a little by-pass that will take so much to the gallon—so much to every thousand gallons of water that goes in of that standard solution of alum. You know how much alum goes into the water.

624 Q. Are you familiar with the different water works systems in the south?

A. In a general way with some of them.

Q. In point of fact, outside of the artesian belts, it has been found, generally speaking, necessary for cities the size of Columbus and larger, to abandon the use of smaller streams and go to the river for water?

Objected to and objection overruled.

A. Why in certain cases, where the city is in reach of the smaller streams originating in the city—it is very difficult to get a small stream that is in reach of the city; and that reason has operated very largely to cause cities, properly situated—that are situated like Atlanta or other towns to reach streams that do not originate in them and flow off from them, they have to go such long distances from the city to get a small stream even, that the custom has been very largely to go to the large streams that are close by.

Q. Isn't it due to the fact that their streams being confined to smaller localities, are more largely affected by local droughts—local conditions, than the larger streams, which traverse a bigger region of country and therefore would not be confined to one locality of droughts?

A. It has been due mainly to the fact that it is very hard for a city to get hold of a water shed that she can control entirely and it has been considered better in many cases to take a water shed that furnishes great quantities of water that comes from a long distance, on the idea that the pollution would be greater, or whatever
625 there might be on the water shed, there would be so much water to purify it. It is very difficult for a city to get hold of a water shed and controlling it or handling it in such a manner as to prevent the dangers of contamination.

Q. Is a smaller stream contaminated, as a rule, before river water?

A. A smaller stream that is thickly settled is more apt to be contaminated than a large stream where there are thick settlements along the stream—in proportion to so many to the square mile, say.

Q. Is Columbus in a less thickly settled section than other cities the same size throughout the south?

A. No, Columbus is situated where there are streams flowing towards the city.

Q. Isn't that true of all cities with rivers and streams flowing to the river, if the city is on the river, towards the city?

A. That's true of a great many cities—a great many of our Georgia towns.

Q. Take the cities that you know of in the south that are as large as Columbus or larger, do you know of any outside of the artesian belt, the main section where it is practical to get artesian water that do not use the river as a source of supply, except Columbus?

A. As large as Columbus?

Q. As large as Columbus, yes?

A. I don't recall any to mind.

Q. How far is Atlanta from the river?

A. Six miles.

626 Q. Then cities as far from the river as that is use river water that are as big as Columbus—as far from the river as Atlanta is?

A. They do. Atlanta does it. She has it to do on account of not having any other source.

Q. Isn't it a fact——

A. (Interrupting.) That would give her the amount of water she wants.

Q. Isn't it a fact that it is partly due to that: I mean the resort of cities the size of Columbus and larger, to the river for water is due in part to the much improvement in filtration, you spoke of just now in the last few years?

A. Well, yes.

Q. As a matter of fact, under the present conditions of the art of filtration, river water as you find it near Columbus, near the southern cities, can be made perfectly wholesome and safe and fit for domestic and drinking purposes?

A. Well, whenever you can't get a supply that you consider better, it is generally resorted to; and for that reason they do use filtration and get the water.

Q. Passes analysis?

A. Passes analysis all right. It is generally done as a last resort. They would prefer to get something that they would consider safer.

Q. But every city the size of Columbus has gone to it?

A. I can't say every city; but most cities that I can think of surrounding it—near it.

627 Q. To get a larger reservoir, you have to have a more extended surface, don't you?

A. What do you mean by more extended surface?

Q. The more gallons there are in the reservoir the more surface it is spread out over?

A. Well, under the best conditions you would want a good deal of depth in your reservoir as well as surface; as where you have got to get a good deal of surface in order to get storage.

Q. Under practical conditions, as you find them?

A. Yes.

Q. For instance: in Columbus, if you wanted a reservoir for 125 or 250 or 500 million gallons, you would have to have a much larger surface than you would for a reservoir of 50,000,000 gallons, wouldn't you?

A. Yes.

Q. And during dry periods—droughts, the evaporation is very much more rapid?

A. Yes.

Q. If it is a long drought even with a larger surface, and your daily supply is more, and you don't supply new works, the water running into that reservoir is no bigger?

A. On account of the size of it, you mean, the reservoir does not increase the quantity of water that comes into it?

Q. That's right?

A. That's true. Has nothing to do with it. The size of the

reservoir has nothing to do with the quantity of water that comes in; but has something to do with the quantity of water that
628 goes out, that is, that is caught and held there.

Q. The purpose of a reservoir, as I understand it, is to tide over periods of drought by accumulating and saving the water that falls during the time of greater rain falls?

A. That's right.

(By Mr. GARRARD:)

Q. That line of valves running east and west just above 17th Street, cutting off all the mains running North, towards Rose Hill, by screwing those valves down and pumping into the system below 17th Street, would that give you an effective and full system of direct pressure?

A. It would so far as the mains are capable.

Q. To the extent of the capacity of the mains?

A. Yes.

Q. If anything broke in the way of pipes, wouldn't it be more apt to be house connections blown out from the mains than anything else?

A. Well, that's not always true. Might possibly be true if they are put in carelessly. A small one is not as apt to burst as a big one, because it has such a little internal diameter, if it is properly connected.

Q. It depends upon the careless- or improvidence of the plumber?

A. Yes.

Q. Does the amount of water delivered in Columbus diminish on account of the falling off of the water at the reservoir so long as the pipe flows full to the city?

629 A. So long as the pipe flows full and the reservoir is full?

Q. Yes?

A. Why the amount of water it brings is independ- of the actual amount that is in the reservoir. It will depend upon it as long as there is 117 feet head and it can get into the pipe. It does not make any difference, as I explained to you, the lower reservoir can be kept full even when the upper reservoir is entirely empty. As long as you keep the lower reservoir full you keep that 117 feet head on the pipe; and you would bring as much as if the other reservoir was full to the top.

Q. So long as that pipe is kept covered with water, even if the reservoir should go down four feet, or any number of feet and the pipe remains covered, so that flow of water flows into the pipe, would there be any diminution in the supply to the City of Columbus?

A. There would be a diminution of head equal to four feet of pressure. If the pipe where it comes in, that pressure can get down to where it can not give the velocity to the water sufficient to make enough water enter the pipe. Suppose it were to get down to where it was not over six inches above the top of the outlet, the pipe coming out of the reservoir, there would not be sufficient pressure to press the required amount of water into the pipe. The pipe could bring more water away than could get into it.

Q. How many feet of water above the opening in the pipe would you say was necessary to fill the pipe?

630 A. That depends upon—For instance that pipe was eight miles long instead of four?

Q. Take this one four miles?

A. In figuring that proportion—what that proportion ought to be, it would have to be more than three or four feet above the pipe in order to get it in, if the pipe is properly put in; and the pipe ought to be bigger where it leaves the reservoir, with a reducer. Instead of being one foot it ought to be at least 24 inch pipe reduced down.

Q. You mean to say then with a head or three or four feet above the pipe at the reservoir, it would flow its full capacity towards the City of Columbus at all times?

A. Minus the head that was above—the head less than 117 feet.

Q. Allowing two feet?

A. You would have to take off that much from your pressure.

Q. Four feet that represents two pounds?

A. In the formula I gave awhile ago, H instead of being 117 feet would be the difference it was. If the water was down four feet it would be 113.

Q. It would be four feet difference, wouldn't it?

A. Yes.

Q. That would bring down the pressure two feet, would it not?

A. About.

Q. The difference of four feet would be two feet?

A. Pounds.

631 Q. Two pounds pressure, that's all?

A. Be a small diminution.

Q. Would be no scarcity of water, might be scarcity of pressure, isn't that true, if there were four feet over the end of the pipe?

A. You would not get quite as much water as you would with it full.

Q. The amount would be reached by taking the number of feet and dividing it by two?

A. You can see it by that formula I gave. Your formula is H, head in feet. Instead of 117 feet would be 113, if there were four feet off.

Q. There would be a very slight diminition even in pressure?

A. Yes, being 4 feet out of the 117, it would be in that proportion.

Q. At the rate of a pound of pressure to two feet of water, about?

A. Yes, in that neighborhood.

Q. I want to ask you this: What would be the effect of turning loose water from two lines of short pieces of fire hose into a sewer, on pressure, while they were being allowed to run into the sewers? I mean this system here as it is in Columbus?

A. Two short lines of hose, say 100 feet or 50 feet long?

Q. Twenty feet, enough to get them into the sewer?

A. With 2 and one half inch opening?

Q. With no nozzle so as to get the full benefit of the hydrant?

A. A nozzle decreases the amount of water. Instead of increasing it, holds the pressure back. A hydrant would flow more if you would not put a nozzle on it.

632 Q. I mean without nozzles?

A. That would be simply two hydrants turned on: It would decrease the pressure considerably in the neighborhood of the hydrant, owing to the fact that there would be a large flow in the pipe—large velocity in those pipes.

Q. So with a four inch main, turning two streams from a hydrant into a sewer, would very much reduce the pressure at that point?

A. Yes, sir.

Q. Wouldn't it run it down to practically zero?

A. Right at the hydrant it would run it down very low, I should say.

Q. What is the proper way to flush a sewer, is it by damming up and filling the sewer with water—It is by damming up the sewer or by having a tank and turning it all loose at one time?

A. The most reasonable way to flush a sewer is to have a tank and you fill it with water and then turn it loose just as nearly altogether as possible. Or if you had a pump it would be that much better. Anything that would fill the sewer perfectly full with pressure behind it or letting the water come as quickly as possible.

Q. Where you take boards 1 x 6 and lay one on top of the other at the end of the sewer and then fill it with water, and have such a flow as I said, by means of two fire streams—from two fire hose into the sewer and fill it with water, do you think that is a proper way in which to flush a sewer?

A. I should think, if I understand you, with boards used as a dam to hold back a lot of water until it fills up that dam and

633 then raise it and let it go?

Q. Yes?

A. That's a pretty good thing to answer in flushing.

Q. Can you get it up in time to make all the water flow off at once and flush the sewer?

A. I should think you could get very good results from it. If you have got the storage back of it, if you could accumulate as much water approximately as you would have in your tank, you could pull out the dam very fast, with six inch plank, one after another, as quickly as possible and get considerable flushing. A very good system.

Q. How near in the neighborhood of the water gauge would the result be shown on the gauge by the turning loose of two or more fire streams through a hose without any nozzle and letting it flow the full capacity?

A. With a four inch pipe?

Q. Or a six inch pipe?

A. Well, the bigger the pipe the better you would keep up the pressure.

Q. Well say first where there are four inch pipes?

A. Well, it would depend upon the length of the four inch pipe that was coming to it, you know.

Objected to as irrelevant.

WITNESS: I would say that it would make a considerable fall.

Q. In the gauge?

A. Yes, make a considerable fall in the gauge. The water could not get there fast enough to get there with any pressure. It would be virtually an open end.

634 Q. Wouldn't it be apt to let air into the pipe?

A. I couldn't say that it would. Be hard to say.

Q. Would it be, by getting the water so fast at the lower end, it could not flow there fast enough to get out?

A. Well, if you were to get air in there it would simply occupy the space that was not filled with water. I don't know whether it would trap air or not. That's the question you ask?

Q. Wouldn't it be apt to trap air, if any opening in private houses was opened at the same time—wouldn't it be apt to suck air that was made in the line of pipe, water closet or anything in private residences, won't air such through there under such circumstances?

A. It might, if there was a connection coming in close to this hydrant. With great velocity going past it and no pressure to it to keep it filled with water, it could suck air in that way.

Q. From residences?

A. From a residence or any kind of pipe that was opened.

Q. Then the opening of those two hydrants at the same time, without proper judgment, would be the cause of the pressure gauge going down very low?

A. I said it would on small pipe.

Q. It would be more or less the same thing on larger pipe, six inch pipe say?

A. Yes. The same rule would hold good, except there would be different effect on a six inch pipe from a four inch pipe.

635 Q. Now Mr. Hall, in laying out this system for a gravity system, as it was laid out at the time this contract was made in 1881, under the conditions it was laid out for the City of Columbus, as it existed at that time, South of 17th Street, could any foresight in this gravity system which was accepted by the City of Columbus, have caused the water to flow on Rose Hill, what is now known as the Rose Hill extension, without a pumping station?

A. I don't think it could have reached the Rose Hill extension, because it was too high for it to reach it. I don't think it would have been practical for a reservoir at that place to reach that Rose Hill section with a practical fire and domestic pressure.

Q. What amount of water can be pumped through the 12 inch main by placing the pump at the reservoir in Alabama.

A. I would have to figure that out.

Q. I don't mean the exact amount?

A. You could increase it very largely.

Q. Wouldn't it double it?

A. Yes, I should think you could double it all right.

Q. So that you would say that the supply of water available to the City of Columbus, by putting a good fire pump of sufficient capacity at the reservoir, could be double: In other words: instead

of two million gallons, there could be delivered four million gallons through this 12 inch main?

A. If you had the water out there to pump. If you had a sufficient storage to get it at the time I should think you could get it—I should think that could be done, provided the main now has the capacity equal to the calculated capacity. In other words: provided it is not stopped up with sediment. Provided it is capable of
636 carrying anywhere up to the calculations for a smooth, clean pipe.

Q. If there is an open end in the Chattahoochee River that can be and is opened at times and the full flow of water is allowed to rush out under 117 feet pressure, wouldn't that have the effect of keeping the main clean and smooth?

A. It would have a good effect on flushing out the main. It would prevent a great deal of sedimentation that would otherwise take place.

Q. Wouldn't leave anything like sedimentation?

A. When it comes to corrosion you can't control it by velocities, so much. Corrosion is a chemical growth that has mud and stuff and iron with it mixed and makes barnacles in the pipe in some cases. As you say, the method of flushing out is a great thing for any pipe that is subjected to sedimentation.

Q. You recall that line of pipe from the reservoir to the bridge, in Girard—you have examined that pipe?

A. Yes.

Q. Is it not a fact that there is not a crook or a bend in that pipe from the reservoir to the bridge?

A. I could not say that. It appears to be a straight line, as near as I could tell. I don't know of any deflections in it. There might be and I don't know it.

Q. In your estimate that you spoke of on yesterday, of $120,000., are you sure that you estimated everything that went into the construction of these works?

A. I am sure I undertook to do it. I tried to do it to the
637 best of my ability.

Q. Didn't you overlook entirely the matter of hydrants and mains in the City of Columbus?

A. I don't think they are specified there. My intention was not to overlook them. My intention was to take the whole system in getting up my report. In making up as voluminous a report as that, it is impossible to prevent some omissions.

Q. The estimate that you made for the City of Columbus contemplated the same kind of pipe that are used at the present time by the Columbus Water Works Company?

A. It did, as near as I could find out the kind of pipe they were using.

Q. You did not state the kind of pipe in your estimate on page 40 but on page 50 you state the kind of pipe?

A. I can't tell from recollection. My recollection is that my full intention was to give a duplication of the system entirely. That

was my full intention and my endeavor to do it as honestly as possible.

Q. Do you not know that there are different kinds and grades, some wrought iron and some cast iron, or pipes that are used in the erection of systems sometimes in water systems?

A. Yes, I have used them.

Q. Did you ever use wrought iron pipe in water systems?

A. No, I have used wrought iron in mining a great deal.

Q. You never used one in a water system?

A. No, never recommended or planned one for a water system.

638 Q. Wouldn't you consider a system that used wrought iron a very inefficient system?

A. No, there is a great deal that is used in the way of mains. There are a great many water works systems in the world that use riveted—steel riveted wrought iron pipe as conduits for the purpose of bringing water to the city; but it is not generally used for street mains. They do use them a great deal as conduits in bringing water to the city.

Q. Do you refer to these pipes in the west that are banded, wrought iron riveted together in order to give them strength?

A. That is wooden pipe that is banded.

Q. No, I mean wrought iron; Wouldn't you think that an engineer that would recommend pipe of that description was inefficient and inexperienced?

A. Wrought iron pipe or wooden pipe?

Q. No, wrought iron pipe?

A. Wrought iron pipe with cement filling——

Q. No, wrought iron pipe?

A. You mean for street mains?

Q. For water purposes—bringing it to the city?

A. O no, I know it is frequently done. There are cases where it is a great deal better to use wrought iron. In the first place it is a great deal cheaper as a conduit, in some cases, because it is so much lighter and doesn't take weight and it is strong in proportion to its weight. It is used very largely in carrying water long distances.

639 Q. What is the life of that pipe?

A. It lasts a great many years if it is put down right and properly banded. I know a line that has been in use, three foot pipe, that has been in constant use, the first time I saw it was in 1875 and it was on old pipe then and it is in use now and good. Three feet in diameter.

Q. Can't you drive an ordinary three inch shingle nail in them?

A. Never knew anybody to try it. That pipe has lasted from '75 to the present, three feet in diameter and from 250 to 300 feet long.

Q. So in making the estimate for the city in detail, you contemplated that the city should use the same kind of pipe that the Columbus Water Works Company uses?

A. You mean the estimate for the new supply?

Q. Yes?

A. Yes, for a duplication.

Q. For a new supply?

A. In my estimate for a new supply I estimated or my intention was to use street mains of cast iron and to use a conduit to bring the water to the city of wrought iron and steel; and it is supported by the best practice.

Q. Wouldn't that rust a great deal?

A. Yes, it would rust some.

Q. Isn't that wrought iron pipe apt to corrode in the form of barnacles and so on, on the inside of it?

A. Yes, very frequently tends that way. I don't know that there is much difference between it and the average cast iron pipe in that regard. I have seen a great deal of it that had been in use
640 for a great many years, thoroughly coated with coal tar or asphaltum inside and out.

Q. Didn't you say just now that that coating came off of every one and didn't count for much in protecting it?

A. Yes, I said in the long run that it would. It would have to be replaced. But it is a protection while it is on there. It would finally come off.

Q. How long is it a protection, is it more than four years?

A. Well, a large part of the time it is a protection. It is impossible to say exactly how long it is considered worth doing or what it would cost to do it.

Q. Well, how would you replace it on the inside of the pipe?

A. You could not do it on the inside of a main that was too small to get into.

Q. Suppose it was a main 12 inches in diameter or 24, how would you replace it on the inside of that main with coal tar or asphaltum after it was laid down and covered up with earth?

A. Well, we have a way in mining, in laying pipe, of putting a man inside and let him crawl through it and do anything you wanted—go right through.

Q. Can you do that in an ordinary city main that is in use?

A. Could not do it with the water in it. Have to take it out.

Q. Did you ever know that to be done in any city system?
641 A. No, I have never known that to be done in city systems; but I have known it to be done in a great many long conduits. My reason for figuring on a conduit of that kind on the outside of the city, was the cost. It is considerably cheaper and as the city progressed other pipe could be put in before the life of it was gone.

Q. Didn't you say, in answer to my question a moment ago, that you figured on the same styles of pipes that were in use by the Columbus Water Works Co. in making your estimate for the city's system?

A. I didn't mean to say that. You were asking about duplicating these mains—duplicating the present system—in figuring on duplicating the present system. I figured on the pipe that you had in as far as I could find it.

Q. Did you find any wrought pipe at all?

A. I didn't figure on wrought pipe. I figured on duplicating the system. That was a different matter entirely from figuring on an ultimate city supply.

Q. Do you refer to wrought pipe, if there was any?

A. I didn't mention wrought pipe in any way in figuring on the question. The question was asked me by the committee as to what it would cost to duplicate the present system. If I had found any wrought pipe in there I would have figured on duplicating it. I could not find that there was any. If you asked the question with regard to my plans for an ultimate system for the City of Columbus, why then I say that I didn't so answer. I didn't know I was
642 answering that kind of a question. I thought I was answering a different question.

Q. You say on the bottom of page 23 of your report, at the bottom of the page—I think you will re-call the figures without referring to it, that the amount of water used per day *by the Columbus Water Works Co.* was 768,000 gallons, is that correct?

A. I said: (Reading:) "I have before me the pressures taken by your committee at base of stand pipe in the city for every hour in 24, beginning with July 31 at 6 P. M., and ending August 1, 6 P. M., from which I compute the consumption during that 24 hours to be 768,000 gallons."

Q. What time did you graduate at Athens?

A. In '76.

Q. You have been, you say a professor at Dahlonegea how long?

A. For about four years.

Q. Takes it on up to '80?

A. Yes, sir.

Q. Now on page 50, of Mr. Hall's report, the following language occurs: (Reading:) "The following is estimate of cost and friction heads per 100 feet of length in wrought pipe, suitable for bringing a supply of 4,166 gallons per minute to pumps from Roaring Creek, Holland's creek or any other source. This is equivalent to 6,000,000 gallons every 24 hours;" and then goes on and gives a description of flanged pipes and the pressures?

A. That's true.

The MASTER: Put that question again?

Mr. GARRARD: I asked him if that was true.

WITNESS: If which is true?

643 Q. The quotation made from your report on that page is true: What is your answer to that?

A. Everything in this report—I will answer that question when I refer to another page.

Mr. GARRARD: I insist that he answer that question.

WITNESS: I would like to be allowed to answer that in my own way; and I promise to answer it correctly.

Mr. GARRARD: I ask for an answer and then he can make any explanation that he pleases?

A. I would like for the court to allow me to read what I said.

It would be as easy for me to read it as for me to say yes. You might make an incorrect reading of it.

The MASTER: Mr. Garrard asks if that extract he has read is true?

(Extract again read over to witness by Mr. Garrard.)

A. That's correct, what he has read. I want to say though that it does not quote me fully there on that point. I think I have just stated before there, No. 3, that Mr. Garrard has not read, wherein I says (Reading:) "Price of cast iron pipe per foot (laid) given in table No. 7, system of city mains, plate IV." Now then if you will refer to that page you will find that I did figure on cast iron pipes being 24 inches.

Q. That was for the distribution system?

A. Yes. It was not for a duplication at all, because you had none of that size pipe to cover. No cast iron pipe that was being used.

Q. You did recommend these pipe, didn't you?

644 A. I gave a comparison of those different pipes so that it would serve as an estimate for knowing how much they would cost as conduits.

Q. That's what you contemplated in order to reduce cost?

A. I contemplated the use of that wrought iron, riveted pipe to bring the water to the city but not for a distribution system in the mains in the city.

Q. You didn't know at that time that that pipe was unfit for that purpose?

A. I had used so much of it that I thought it was pretty good to bring water in.

Q. You had used it for city supply?

A. City water is not much different from other water. It is a question of whether it would bring water. That's the main thing I wanted to do, to bring the water to the city. I had used it for bring- a great deal of water.

Q. Does it last long?

A. Yes, it lasts a good long time.

Q. Do you not know that wrought iron pipe gets very thin from the inside in the course of a very few years and holes appear all about in it until the water percolates out from it in large quantities?

A. I have used a great deal of it, Mr. Garrard and used it very satisfactorily. I expect most anything of that kind will wear out in time; but I think that in a great many cases it is economy to use it; and I think you will find it in a great many city supplies. You will find it in the supply to Liverpool and you will find a six foot main at that.

Q. Have you seen that?

645 A. No; I have not seen it; but I have read descriptions of it. I have been to Liverpool but I did not examine that pipe.

(By Mr. WIMBERLY:)

Q. Did you in your direct examination state how many feet was filled in, beginning from the top on down?

A. In the new examination of it?

Q. In the new examination as compared with the old?

A. No, that question has not been asked me at all.

Q. I will ask you about this filling in. You said from here—(Referring to map).

A. From here down?

Q. Yes. From the top down to wherever it is filled in?

A. It is filled in down to the bridge and below the bridge, where it is shallow.

Q. How far below the bridge is the shallow?

A. Something I should say like 150 feet. The shallowness does not extend out over 150 feet below the bridge. After that I made soundings in the main body of the reservoir and it was not filled up. I was surprised to find it that way. I expected to see it filled more than it was.

Q. The rest you found not filled in?

A. It might probably have been cleaned out.

Q. The main filling in was from a point about 150 feet below the bridge up to the end?

A. To the upper end, from the bridge it is nothing but a shallow creek bed, no storage at all.

Q. Measuring down from there in number of feet, is a good many feet?

A. Yes.

646 Q. So that part, where it originally went at the time of your first soundings, has very much narrowed—is very much shallower?

A. From here to there, yes. (Indicating on map.)

Q. So that the quantity of water that is lost by filling in at that point really amounts to a very small proportion?

A. Amounts to nearly two million gallons.

Q. Did you figure that out in gallons, from there on up, to be as much as two million gallons?

A. That's about right. The other part of the reservoir is about as deep as it ever was.

Q. In other words: it has lost 2,000,000 out of an original total of 39,000,000?

A. Yes.

Q. Now taking the original capacity of 125,000,000 gallons, that is a good big reservoir as compared with other cities, isn't it?

A. No, I think not.

Q. You furnished in your report statement showing the water works statistics for 50 — the largest cities in the United States?

A. Yes. That was done by the Committee. I didn't do it. That is not my report at all. I think though that is correct.

Q. Taking 50 of the largest cities there are only about——

The MASTER: The report speaks for itself.

Mr. WIMBERLY: I wanted to base a question on the report.

647 A. That portion is not my report at all. That is the committee's report.

The MASTER: You say, though, that you think that is about correct?

A. I should think it would be. I have not examined it but I think though that they had the data at that time, and I think probably that it is correct, unless there is a typographical error.

Q. In the entire United States there are only about ten cities, I mean taking the 50 biggest, with reservoirs larger than 125,000,000?

A. Those are mainly clear water reservoirs, I suppose.

Q. Every one of these are put down reservoir capacity?

A. I think they are intended for clear water reservoirs. For instance: In Atlanta we have a reservoir that we pump water into up on a hill which holds 190,000,000 gallons. It is pumped into it with a steam pump. That is intended for a storage reservoir to hold water that is to pass over several days' supply.

Q. That's only one then?

A. It is necessary there to have the water in case of an accident. We have always got a supply in the river.

Q. In that case you have got this one reservoir then?

A. It is the only reservoir they have. Don't need any reservoir to store the water to tide over low stream, floods or anything of that kind, because they get their supply from the river. All they need is settling basins preparatory to filtration.

The MASTER: Who do you mean by they?

A. The City of Atlanta.

648 Q. The City of Atlanta——

A. (Interrupting.) They have got a supply in the river at all times, so far as their supply is concerned.

Q. You speak about storage, that's the only reservoir they have, clear water or any other kind?

A. That I am not prepared to say whether that is the case or not. I don't know whether it includes Croton reservoir. That is a storage reservoir, pure and simple, in New York City. That storage reservoir stores the water from Croton River; and is one of those cases where the supply is from a small stream. New York is supplied from a small stream.

Q. Coming to the matter of local droughts, the shorter the stream why the more it is affected by local droughts isn't it?

A. Yes, the shorter the stream the smaller the water shed and the more danger there is of drying up from lack of rain fall.

Q. And the conditions of local droughts vary even very considerably sometimes in distance of a few miles, don't they?

A. They do.

Q. A gauge record kept at one place would not necessarily be reliable for a water shed ten miles from there?

A. No, not necessarily. It might represent the average conditions but would not represent the real conditions. Sometimes you have very great local rain falls within a few miles of a place where there is very little.

A. Taking a short period: It is also true you can not tell
649 by just taking the rain fall during a month or during six months without also *have* a record as to how it is distributed, just what its effect is on the streams, can you: You have a provision for passing off storm water, don't you?

A. Yes, sir.

Q. Your storm water is necessarily lost?

A. No, not all of it.

Q. A good deal of it where you want to protect the purity of your supply?

A. Yes, a good deal of it is lost.

Q. If any particular season the rains happen to be so distributed as to consist almost entirely of showers of short duration, where the water falls for a little while and not in large quantities during that time so as to make storm water, the bigger part of that is wasted, and the reservoirs lose the permanent benefit, even where it is distributed equally along during the entire month?

A. That would be true to some extent, at least.

Q. The best test of a drought would be as to how the streams in the locality were generally affected, or as to how the wells were affected, whether the springs went dry and things of that sort—that would be worth a great deal more than weather reports?

The MASTER: Your question is rather argumentative.

Mr. WIMBERLY: Do you prefer that I put it differently?

WITNESS: I would prefer that you put it differently. I don't mean to answer it that way. I don't want to answer yes or no. I want to make myself understood. Probably it would be better——

650 Q. What is the best practical test as to the severity of the drought in a particular locality, so far as it affects water courses?

A. You mean in order to predict what can be done in the way of storage?

Q. In order to predicate results?

A. Two things are necessary. One is, in low water the flow of the stream, how much can be depended upon for storage at all. Another is to know how much of that water can be stored and what proportion of it—estimate what proportion of it is to be thrown away on account of keeping the mud and sediment out of the pond.

Q. Storm water?

A. Yes. What kind of works can be arranged to hold the water, etc.

Q. As affecting the regular flow of streams in this country, the rains that make them up or springs, is it the slow rains that are frequently distributed during the month or is it the total amount of rain fall that is due chiefly to the locality?

A. Well, the distribution is very largely to be considered and the time at which a greater portion of the rain falls. For instance: when I say distribution, I mean distribution through the year. Whether it all falls at once or it all comes along so much per month pretty evenly.

Q. Also as to whether it rains long or short duration: Slow rains generally soak up in the earth?

A. That has more to do with what the ordinary flow of a stream would be. When it comes to impounding water, you *you* can
651 sometimes get a larger amount of impounding water from a constant rain than any other kind, because it all runs down the stream and does not have time to percolate. You would probably catch a great deal more water from constant rains than you would otherwise, when it comes purely to catching water or water that is stored, except what is passed off in storm water, for the purpose of filling up the reservoir.

Q. So that the Weather Bureau Reports alone, even for that exact locality, would not indicate as to the severity of the drought on streams and water courses——

A. They would probably be the best index we would have.

Q. They alone would not be the only guide?

A. They would not. Should not be the only guide; but they would be a very good guide if you didn't know anything else. They would be the most important guide, still you ought to find out anything else you could about it.

Q. You ought to get them for much larger periods, like a month or the rain fall each day?

A. Ought to have the daily rain fall, covering as long a period as possible.

(By the MASTER:)

Q. Mr. Hall, I want to ask you one or two questions: I think you testified yesterday as to what was your opinion as to the efficiency of the present mains in Columbus to supply the city: What would you say would be the necessary size of a storage reservoir for a city the size of Columbus, taking into consideration its present population and its possible growth in the future?

652 A. In order to have the water from a local stream?

Q. Yes.

Mr. WIMBERLY: Other than the river?

WITNESS: I will give you that.

The MASTER: Is that your report that you made in '93?

WITNESS: Yes, sir; I think I have it. 580,000,000 gallons capacity was the storage reservoir—the largest storage reservoir I figured on 10 years ago. I figured from that that a 6,000,000 gallons supply might be made available. I would say this: if it were practicable, I would in actual construction make that reservoir larger, if I could do so without any great additional cost, in order to have that 6,000,000 gallons supply. I think a 6,000,000 gallons supply ought to be provided for. To back that up, I would like to have a reservoir situated so we could get a good supply of water from as many sources as possible from a water shed as big as this Roaring Creek water shed, which is a little over 4000 acres, which has another stream in the rear of it, Standing Boy Creek. With the

Standing Boy and a storage reservoir of the capacity of 580,000,000 gallons, I think it would be absolutely adequate.

Q. Have you got the figures in your report for a supply reservoir too?

A. For the cost of it?

Q. For the capacity?

A. These figures are for the Roaring Creek reservoir. Then I also gave figures on Holland's Creek reservoir, at the present place.

653 Q. I will ask you this question: If you had in mind at the time you made those figures in '93, not only what was needed at that time, but to provide for the possible growth of the city for a long time in the future?

A. Yes, sir.

Mr. WIMBERLY: A consumption of six million gallons?

(No answer.)

Q. What do you think is the best source of supply for the City of Columbus for its water, taking into consideration its present population and its possible growth, from your knowledge of all the conditions of the city and all, from the report you made in '93?

A. Well, that is a question really that I have not fully decided on. I consider that the best source I found, local source, was Standing Boy Creek, with a large reservoir that could be used to be filled from it and this Roaring Creek, because a large reservoir could be built there. I have generally considered that owing to the location and owing to the fact that a very large supply of water could be brought from the other creek contiguous to it to put into the reservoir, it was probably the best solution of the question.

Q. That's your idea as to the best solution of the question under the present conditions?

A. As a source of supply.

Q. So you are not prepared to say what you consider, in answer to the general question, as to what is the best source of supply?

A. I could not say that I have come to a positive, ultimate conclusion on that point. It is a very mixed question.

654 (By Mr. WIMBERLY:)

Q. With the water drawn from the river you would need no reservoir at all?

A. None, except you would need a settling reservoir, need a large reservoir for that, in order to filter it.

Q. I mean storage reservoir?

A. No, not in the sense of this other reservoir. What you would need would be a very large settling basin in order to be certain to have a proper quality of water to treat, having a uniform muddiness in your water.

Q. For a city the size of Columbus and the danger of a creek as close to it as Roaring Creek becoming contaminated from local agencies, looking to the future as well as the present, would the supply from Holland's Creek be sufficient, with the aid of filtration

furnish pure water under ordinary conditions, and an arrangement by which the river water could be drawn into it to supplement at periods of extreme drought and accompanied with a high lass filter apparatus, would be the best solution of the whole thing?

A. I don't see the advantage of having another source if you are oing to take part of it from the river. I don't see much advantage.

Q. Just as an emergency to fall back on for a few days, if it becomes necessary?

A. Why, if it is not a dangerous thing to do to have a small mount of that water, I should not think it would be dangerous to ave all of it.

Q. I am not speaking about the dangers: with your knowledge of the river here—I believe you said something about filter-55 ing river water that would be healthful and pure, with the large quantity of water that there is in the river: The main ing is the prejudice against river water, isn't it?

A. Yes, on account of its being river water. People that have ad it have a good deal of trouble with it, in some places, but they ave had to have it. There are a great many towns—all that I can y about that, there are a great many town using sources of supply at are much worse than that would be. A great many big towns ave to do it because they are obliged to do it. I think in most ses if they had a better source they would use it.

Court here took a recess for dinner.

56 WEDNESDAY, *March* 9, 1904.

Court met pursuant to recess and the hearing was resumed.

A. E. BOARDMAN, sworn by the complainants, testified as follows:

(By Mr. WIMBERLY:)

Q. What is your profession?

A. Civil Engineer.

Q. What branch of the profession have you given more especial ttention to?

A. What is termed gas and water works branch, that is, the conruction and operation of gas works and water works for the supy of cities.

Q. What time did you graduate?

A. 1870.

Q. What institution?

A. Rensselaer Institute, at Troy, New York.

Q. Since that time have you been engaged in this line of work?

A. In this particular branch of work since '73.

Q. Have you been continuously engaged in this line of work since 873?

A. Continuously, yes.

Q. State whether or not in such work, you have planned and onstructed any systems of water works for municipal supply?

A. I have planned and constructed and had constructed under

my direct supervision eleven water works systems in Southern cities; and have acted as consulting engineer for several others in different parts of the country.

Q. Have you had charge of any systems after they have been constructed—had charge of the operation of them?

A. I have had charge of the operation of some seven of these systems. I am in charge now of three of them—still in
657 charge.

Q. At different times you have had the actual operation of seven?

A. Yes, sir.

Q. Will you mention some of the systems that you yourself have constructed?

A. At Macon, Ga., at Americus, Ga., Brunswick, Ga., Ocala, Fernandina and Tampa, Fla.; Tuscaloosa and Florence, Ala.; Johnson City, Tenn.; Richmond, Ky; and then I have constructed—partly constructed and reconstructed works at Raleigh, N. C., and Charlotte, N. C., and Oskaloosa, Iowa; and perhaps some others that I do not recall at present.

Q. By reason of having constructed and been interested in these different water works systems, have you made a special study of water works conditions in this part of the country particularly?

A. More particularly in the South. My field of operation has been mostly confined in Southern cities. I was the engineer and managing official of the firm of Jeter & Boardman, who built most of these works and operated them for several years after building.

Q. You were a member of that firm?

A. I am president of it now.

Q. The system at Macon, who constructed that?

A. I did from its incipiency.

Q. Has it been re-constructed?

A. The pumping water supply system was re-constructed in '97 and '98. I had charge of that plant and had it constructed under my supervision, taking the water from the Ocmulgee River.
658 Previous to that time we had taken most of the water from springs below the city; but the source became inadequate and we had to go to the river. We had to go to the river as early as '91, where I carried on extensive experiments in filtration.

Q. I was going to ask you as to what special study you had made of the subject of filtration?

A. I have made that special branch of my profession, having had to take the study up when we were forced at Macon to go to the river for water. At that time mechanical filtration, as we understand it now, was comparatively a new thing. While experiments had been successful in some northern and western waters, none had proved successful in the South; and I had three different filtration companies to attempt to filter the Ocmulgee water without success; and by observation and study and by combining the good points of the three systems, I ultimately succeeded in filtering the Ocmulgee River water satisfactorily; and that same system has been applied,

with such modifications as local conditions suggest successfully to other southern waters, notably: Raleigh, Charlotte, Columbus and Tuscaloosa.

The MASTER: Let me ask you a question right there: You used the expression "at that time" just now in reference to knowledge of filtration of these waters: You mean by the expression "at that time" '91 or '97?

A. 1891.

(By Mr. WIMBERLY:)

Q. You finally perfected that system and put it in practical operation in these different cities about what years?

A. In Macon I was filtering water successfully in '92—
659 the winter of '92 and '93. In Charlotte, I think it was in '96; and in Macon again, re-constructed the works in '97 and '98. In Raleigh in 1901; and I think Tuscaloosa in 1901 and 1902 and Columbus in 1903.

Q. Now I was coming to Columbus: At what time were you employed to examine into the condition of the Columbus Water Works system?

A. It was September or October of 1902 that I first examined conditions here.

Q. In your affidavit you stated September?

A. Latter part of September or first of October.

Q. The present filtering system here, who planned that?

A. I planned it and had it constructed under my supervision.

Q. While you were down here as part of your employment, did you make an examination of the water works plant here?

A. Yes, sir; had to do that to suggest remedies.

Q. In doing that did you examine the reservoirs and sources of supply in the surrounding district here?

A. I did examine the reservoirs in Alabama and also some streams on this side of the river.

Q. As a result of your investigation, state whether or not you are familiar with conditions surrounding Columbus and the available sources of water supply?

A. I am fairly familiar, as much as I could be in the short time at my disposal.

Q. At the time you came down and made your investigations in September, 1902, what conditions did you find prevailing at that time?

660 A. I found the upper reservoir on the Alabama side entirely empty. There were several hundred thousand gallons of water in the lower reservoir but that was not in use because of its having become stagnant. They were then using water from the river in an unfiltered condition—taking water from the river at the City Mills and also with a pump situated below the dam of the City Mills about the foot of 17th Street—steam pump. The other pump was a power pump, operated by water power from the City Mills. That water was unfiltered water and was being pumped into the mains as a supply for domestic and fire purposes.

Q. Those conditions, the water drying up over there, was that confined to that stream or how extensive were they generally in this locality?

A. They could only get water from the river at that time.

Q. What was the condition of different streams in the vicinity of Columbus at that time?

A. Most of them were dry, sir. Few had very little water in them; but most of them were practically dry, I should say, except the larger ones.

Q. Do you know anything about what kind of a drought prevailed in Columbus at that time?

A. Yes, sir; at that time it was approaching the end we thought of a very extensive drought. The whole of Alabama and Georgia were suffering, this particular section more than any other. I think though we felt it as far as Tuscaloosa. Felt it in Macon. The streams were very low or dry. I came from Macon over here and I noticed all the streams were very low.

661 Q. Was that a usual or unusual drought?

A. I should say it was unusual. I had never seen streams in such a condition.

Q. You have lived in Georgia nearly all your life?

A. I was born and raised in Georgia, yes, sir.

Q. Now you said something about some pumps that the company was using at that time, where were those pumps located?

A. One was located at the City Mills and the other was located at the foot of 17th Street.

Q. In your affidavit you said something about some fire pumps at the Eagle & Phenix Factory?

A. They were connected up so that they could be used in case of fire. I did not see them in operation. They were connected and ready for use. Arrangements had been made so they could be used.

Q. So they had made that preparation for an emergency?

A. Yes, sir.

Q. Do you know when these different pumps that you found were put in?

A. No, sir; I do not.

Q. Was it a recent thing: Could you tell from the conditions whether it was recent or had been done several years?

A. The pump at the City Mills—the power pump had been there some years; and the others more recently.

Q. The others more recently?

A. Yes, may have done the other more recently.

Q. After looking over the situation what conclusion did you reach as to the city's available source of supply?

A. I concluded that the only practical supply was the river.

662 Q. Mr. Boardman, in reaching that conclusion—Have you any knowledge of what other southern cities had to do for their supply?

A. Yes, sir.

Q. What is the experience of other southern cities the size of Columbus and larger?

A. Well, as a general thing if a river is within reach, they go to it.

Q. Outside of the artesian belt, how has it been with cities throughout the South?

A. In the majority of instances, as the city grows they have got to go to large streams for their water supply.

Q. Has that been the experience of cities generally?

A. Yes, sir.

Q. Can you mention some of the cities?

A. Atlanta had to do it; Macon had to do it; Augusta has always taken hers from the river. Chattanooga also takes hers from the river; and Charlotte has got to go to the river.

Q. Has got to go now?

A. Yes, she will have to go there within the next few years. I am planning a system with that end in view now.

Q. How is it with reference to Columbia, S. C.?

A. Columbia takes hers from the river.

Q. How is it in Lynchburg?

A. Takes it from the river.

Q. How about Richmond?

A. Richmond, also. Nashville does the same thing.

Q. Have you mentioned any Tennessee cities?

A. Nashville and Chattanooga both have to go to the river for their water.

Q. How is it at Nashville—I mean Knoxville?

A. Knoxville takes it from the river.

663 Q. How does a river supply compare in purity with a supply from other streams sufficiently large to be relied on in dry years as well as wet years for a city the size of Columbus?

A. The river is preferable. The same character of water is met with in the small streams because they contribute to make up the river. The river is an assemblage of the small streams. Covers a much larger—the drainage area is much larger and the chances are the pollution is much less in proportion.

Q. On account of the larger volume of water?

A. Yes. The entire water-shed is seldom polluted. The entire water-shed of a small stream may be.

Q. How does the Chattahoochee River compare in clearness or muddiness with the Ocmulgee River at Macon?

A. I don't think it is quite so muddy. Does not have quite as large quantity of red mud in it. Drains a more sandy soil.

Q. What effect on the purity of the stream has the existence of considerable fall, rapids like the Chattahoochee River above Columbus, as compared with some of the sluggish waters?

A. The exposure of water to the air and sunshine is one of the most efficient means of purifying it. Complete oxidation goes on more rapidly where it is exposed to the sunshine. So that we always consider a rapid stream, running over rocks, continually exposed to the air and sunshine, more preferable than one that flows along slowly between a flat country.

Q. Are you familiar with the topography of Georgia near
664 the Chattahoochee River above Columbus?

A. As a general matter, yes.

Q. How is with the Chattahoochee above Columbus?

A. The Chattahoochee has a considerable fall for 40 miles above here; and then up at the headwaters it is a very rapid stream, coming from the foot of the hills of the Blue Ridge Mountains, draining that section of the country. It is very fine water.

Q. You spoke of having made a special study of the science of filtration in the removal of such impurities in water as might be deleterious to health?

A. Well, we consider that proper filtration is one of the safest methods—the most efficient methods of removing any deleterious substances from water, mud—matters in suspension, as well as microbes, and spores of vegetable and animal growth. We guarantee the removal of from 98 to 99 per cent. of all bacteria, whether injurious or not, in properly filtered water; and some companies go as high as 99 per cent. guarantee.

Q. What would you say as to the filter plant of Columbus as to its efficiency as compared with other modern or approved plants?

A. The filter plant at Columbus consists of a Jewel—Improved Jewel Filters, which I think are probably the best that science has reached, certainly among the best.

Q. This particular plant—I suppose even with the same system they may be different in detail—the particular plant that you have got here——

A. (Interrupting.) As regards different treatment of dif-
665 ferent waters.

Q. Taking this particular plant as constructed, what would you say as to that?

A. I think as constructed, for the amount of water it is intended to deliver, it is as complete as can be devised.

Q. You speak of the amount it is intended to deliver, what amount is it capable of delivering as at present constructed?

A. It will deliver of thoroughly filtered water about 1,600,000 gallons from the river or 2,600,000 from the reservoir on the Alabama side.

Q. Say using partly river water and partly reservoir water?

A. About, I should say, 2,000,000 gallons per day would be a fair average.

Q. That is, using the two in combination?

A. Yes, sir.

The MASTER: I understand from that, with the present plant you have there—the filter plant, that the capacity from the river and reservoirs together is 2,000,000 gallons?

A. Yes, sir. You understand, your Honor, in taking river water alone, it has a great deal more sediment in it than the water from the reservoirs in Alabama, which has very little sediment—very little mud in suspension. It comes from a sandy soil and is comparatively clear. It has some sediment and probably has a little more vegetable matter in suspension than the river; but it has not as much mud

and does not clog the filters quite as much and does not require the washing of the filters as often. We can filter more water of
666 that character than we can where it is full of mud or sediment, such as river water.

Q. The more mud there is the smaller quantity it will filter?

A. Yes, sir; per day.

The MASTER: The Statement that you made that the filter plant—capacity of the filter plant was 2,000,000 gallons per day in the range of about 1,600,000 gallons from the river and the balance from the reservoirs: I understand you mean by that that is the present capacity of the plant only in stages whether the water at the reservoir is at its minimum? Or I will put it another way: Is that capacity confined to the river and the reservoir together?

A. I will state it this way: If the reservoir is in condition to furnish 2,600,000 (two millions six hundred thousand gallons) per day, the filters will filter that amount. If, however, a certain amount, say half of the necessary amount is taken from the river, the filter will filter 2,000,000 gallons. If all the water must be taken from the river, I would not wish to guarantee more than 1,600,000 gallons. With mixed water, half and half, it would filter two millions.

Q. Mr. Boardman, speaking—I believe some questions have been asked as to the effect of a city the size of Atlanta draining into a river like the Chattahoochee, the same distance above Columbus: What would you say as to the capacity of the filter to purify the water in the event there was such drainage from Atlanta?

A. I would not hesitate a moment to use the water as a
667 supply or to recommend its use.

Q. I will ask you: in the thickly populated cities of the east and middle States, what conditions exist there?

A. I am familiar with the conditions in Chester, Pennsylvania. That will probably be an extreme case. Chester, Pa., takes its water supply from the Delaware River, 13 miles below the city of Philadelphia. That is below the conjunction of the Schuylkill and Delaware Rivers. These two rivers take the entire drainage from the City of Philadelphia and its suburbs. The City of Chester has taken that water from the beginning of its existence, until last year, without filtration, merely sedimentation. Last year a system of filtration was perfected and put in operation, as a matter of precaution. There has been some complaint of the water being offensive at low stages of the river; but I have not heard of any proof of excessive sickness from that source. The large city of Newark, New Jersey, for years took its water from the Passaic River below the drainage of Paterson, which is also quite a large city and I think not over 27 miles apart. For years that was the source of supply without filtration. Within recent years, however, they have gone to another source of supply of water for Newark. Those are probably the most notable cases.

Q. I will ask you about the City of Philadelphia?

A. The City of Philadelphia takes it water supply and has for many years, from the Schuylkill River. Above the point where the

water is taken are several large towns and villages; and it is
668 only now constructing a system of filtration.

Q. You mean it has not had a modern system until recently?

A. It has not— it yet. It is under construction.

Q. On this subject of filtration, bearing upon the history of the art, in 1882, how did those systems in use then compare with those in use at the present time?

A. When?

Q. 1882?

A. I think the first—this is merely from memory—my impression is that the first mechanical filtration systems were inaugurated in 1886.

Q. When were they perfected?

A. Been gradually perfected since then. The first ones very crude affairs, not near so efficient as the present ones.

Q. I will ask you to look at the contract between the City of Columbus and the Columbus Water Works Company, originally White, paragraph eleven, as to the filter provided for in that contract: What sort of a filtering system was that as to its effect on the water?

A. (Witness reads contract handed him.) That would be only a strainer, sir. Would not be filtration at all.

Q. Would that remove deleterious and dangerous ingredients in water?

A. I should not think it would. Remove some little mud, sticks and leaves; but it would not remove any bacteria. It would not remove silt, the finer particles.

Q. What are the real dangerous ingredients in water?

A. Bacteria from animal excreta are the most dangerous.

Q. You say this would not remove those at all?

A. No, sir; have no effect upon them.

Q. Taking the present system and using river water at the point where the in-take pipe is, and your familiarity with the system, what would you say as to the quality of water furnished?

669 A. You mean from the reservoirs?

Q. The reservoirs, speaking separately or the reservoirs and the river. I mean after it passes the filter?

A. After it passes the filter I don't think anybody could detect the difference.

Q. Taking each source separately, what would you say as to the river water after it is filtered?

A. After it passes the filters it is perfectly pure.

Q. What is the purpose of the upper reservoir—what purpose does it subserve?

A. It is what we call an impounding reservoir. Gathers the water and allows it to settle, all the suspended matter before it is taken into the lower reservoir. Frees it of as much mud and sand as possible before going into the lower reservoir. It is taken from the top of the upper reservoir, which is the clearest part of the water. It overflows into the lower reservoir and from the lower reservoir into the city mains.

Q. What character of water flows from the upper reservoir to the lower reservoir?

A. The cleanest of the water in the upper reservoir comes to the lower.

Q. Have you at any time since that drought seen these reservoirs, the upper and lower reservoirs?

A. Yes, sir; several times.

Q. What is the quality of the water?

A. The quality of the water in the upper reservoir is fairly good.

Q. How is it in the lower?

A. It is better in the lower, freed to some extent from sand and silt.

Q. Something was said about some grass and vegetable matter, I believe, sometimes being in the upper reservoir?

A. Yes, sir; when I was there in the Fall of '92.

670 Q. 1902, you mean?

A. 1902. They were cleaning them out at that time the reservoir was empty and they were cutting down this vegetation that had grown in the upper reaches of the reservoir, which had been exposed to the sun and air. I supposed of course the gradual lowering of the reservoir had exposed all that; and a rank growth of grass had grown there and acquatic plants and they were cleaning it off. They had a force of hands there removing that so as to get it removed before the reservoirs filled up again.

Q. Take it under ordinary conditions, the grass and plants growing around there, how do they affect the wholesomeness of the water?

A. They do not affect the wholesomeness of the water at all, until they die or begin to decay. Then they are apt to give rise to stomachic troubles, such as diarrhœa and things of that kind.

Q. That would be in the event of any——

A. (Interrupting.) A. Of any excessive amount getting into the water, might give rise to some diarrhœa troubles.

Q. I will ask you whether there is any grass or vegetable matter or other impurity in the water in the lower reservoir?

A. I didn't see any. There is a rock bottom there and was quite clean on the sides. It is riprapped with rock or stone so that grass or vegetable matter does not grow in the lower reservoir.

Q. I wish to ask you now as to the adequacy of the water supply for the present needs of the city: What quantity of water is adequate for the present use of the city?

671 A. The city is now using a little less than a million gallons a day.

Q. I will ask you whether the system supplies sufficient water?

A. The system will supply more than that from the reservoirs in Alabama alone.

Q. Without having to draw on the river?

A. Yes, sir.

Q. Now in the line of Judge Newman's opinion, directing investigation as to what changes in the present system—what improve-

ments would better the service: I will ask you whether you have been over the system with a view to suggesting changes of that sort?

A. Yes, sir; I have made a little study of it and some calculations in regard to what I thought would be necessary and best.

Q. Have you a map there?

A. Yes, sir.

(Witness here produced a map.)

Q. Now Mr. Boardman, what changes would you recommend in the present system with a view of increasing the efficiency of the fire service?

A. I should recommend a larger main from the pumps to the standpipe on Rose Hill; and from the intersection of 17th street and Third Avenue, the entire length of Third Avenue to 6th Street. I should put some cross mains upon the streets, the numbered streets, not the avenues, so as to tie the mains—the small mains lying down the avenues, tie them in with larger mains to this central large main down Third Avenue; tie up the dead-ends and increase the amount of water to be delivered to the outer edges of this area now covered. Enabling the present system to deliver a great deal more water at higher pressure at any point in the city; and to permit of
672 extensions to new districts as the city requires them. That can be done with comparatively small expense.

Q. Let's take that up in detail as to sizes so as to get it in the record: Now you say you would recommend a larger main between the standpipe and the pumping station.

A. Yes, sir.

Q. What size?

A. I should recommend a 16 inch pipe for that.

Q. How would that compare in the quantity of water it would deliver with the present pipe?

A. The present pipe is six inches.

Q. Two six inch pipes?

A. The capacity of those pipes would deliver—let's see—that pipe would deliver about 3½ times as much water with the same velocity as the present pipes.

Q. How about friction?

A. But the friction would be very much less even then.

Q. At high velocity how would the friction loss compare with the proposed larger 16 inch pipe to the present two six inch pipes?

A. The two six inch pipes would have about 27 times the friction that the larger pipe would have.

Q. With the same quantity of water?

A. Same quantity of water.

Q. You spoke about running a large main down Third Avenue: I will ask you why you selected that Avenue?

A. Third Avenue appears to me from the map to be nearer the center of distribution of the whole system; and the effect of a large pipe from the standpipe running down the center of dis-
673 tribution would be to place the standpipe at the intersection of these various cross streets. It would be equivalent, very

nearly, to having the standpipe removed to either one of these points and supplying the lateral mains running from that point. For instance: if a fire should take place at 14th Street upon either side of this main, it would be equivalent to moving the standpipe down to 14th Street and Third Avenue, with very little decrease in head because of friction.

Q. On account of the large sized pipe?

A. The amount of water to supply the demand being moved so slowly through that pipe, the friction would be very little. It would be just the same if it was down anywhere on 9th Street on either side. The friction between the present position of the standpipe and 9th Street would be, I suppose, about 13 pounds loss, between those points—would be all there would be.

The MASTER: You mean as the system now stands?

A. The system I should recommend. I suppose now the friction would be nearly four times that.

Q. What size pipe would you recommend for Third Avenue?

A. 16 inch down as far as 9th Street.

Q. You said 6th Street before?

A. I meant 9th Street.

Q. Taking it up by streets: The present standpipe is where?

A. It is on Rose Hill.

Q. Which is a little above 20th. Then you would recommend a 16 inch pipe leading from that standpipe down Hamilton Avenue?

A. To 17th Street down Hamilton Avenue.

Q. Down Hamilton Avenue to 17th Street. Then where would it lead, that 16 inch pipe after you got to 17th Street?

674 A. From the intersection of 17th Street to Third Avenue and down Third Avenue to 9th Street.

Q. Now the pipe from the pumping station?

A. From the pumping station on 17th Street to the stand pipe on Rose Hill.

Q. It would lead from the pumping station, along 17th Street to Hamilton Avenue and then up Hamilton Avenue to the stand pipe?

A. That would be a 16 inch pipe, yes.

Q. And then from 17th Street?

A. Down to 9th Street on Third Avenue.

Q. That would also be a 16 inch pipe?

A. Yes, sir. From 9th Street down to 6th Street I would put in a 12 inch pipe; and then I would tie up these various streets. Then on 5th Street or 4th Street rather, starting down at 4th Street, I would tie that in from Broad to 5th Avenue with six inch pipe.

Q. From Broad to 5th Avenue?

A. Yes, with six inch pipe, connecting or tying up those dead ends on those hydrants.

Q. That would tie up all the dead ends that come down as far as 4th Street?

A. Yes, sir. Then on 5th Street I would put a 6 inch pipe from Broad to 5th Avenue and tie up all the dead ends there. Then on

8th Street I would run a six inch pipe from Front Street to 4th Avenue re-enforcing the small pipes running on the various avenues. All these lateral pipes would be connected with the pipes running down on the Avenues and also with the 16 inch main; so it
675 would make additional pipes to these pipes now running down the Avenues from the 16 inch main, reducing the distance the water would have to travel to reach these various hydrants.

The MASTER: You would not disturb the present pipes at all?

A. No, sir; I would utilize all of them.

The MASTER: Including the 4 inch pipe?

A. No, put down this larger pipe. Considerable of the 4 inch pipe would be taken up. On 9th Street I would place a 12 inch pipe from Front Street to Sixth Avenue. On 13th Street I would place an eight inch pipe from Broad Street to 6th Avenue. On 14th Street I would place a 12 inch pipe from the present 12 inch pipe on Warren Street to Sixth Avenue.

Q. From Warren Street?

A. From the present 12 inch main on Warren Street out to 6th Avenue. On 15th Street I would extend the present 6 inch pipe to 9th Avenue, running up 9th Avenue to the Cemetery Street and out Cemetery Street to 10th Avenue and up 10th Avenue to 17th Street and there connecting with the six inch pipe on 17th Street; and making a circuit of that portion of the city. On Ninth Avenue I would place a six inch pipe from Seventh Street to 12th, connecting the dead ends now on that avenue.

The MASTER: That, as I understand, would be a kind of a backbone of the system?

A. Yes, sir; and also tying up some arteries. Of course these various pipes would have to be supplied with valves for the
676 proper regulation of the various districts, so that in case of repairs or improvements a small portion of the city only would be cut out of water during the time of such repairs or improvements.

Q. So as to minimize the area that would have to be cut off when you were making repairs?

A. Yes, or extensions.

Q. With these changes that you have just enumerated, what sort of a system would that give the city as to fire protection?

A. That would give the city a system that would compare favorably with other cities of this size. Very efficient. The pressure along Third Avenue from the standpipe would then vary from about 80 to 90 pounds.

Q. Now Mr. Boardman, let's take the other portions of the system, on the smaller pipes: With that main central artery and these different pipes that you have got—the pipes tying up the dead ends, how would it be on the remoter parts of the system in the lower part of the city?

A. It would increase the pressure upon all the hydrants in the city, depending, of course, upon the amount of water being taken from them. I will explain to your Honor: In a city of this size,

or approximately this size, the amount of water that should be furnished the mains should be proportioned to the domestic demand plus the proper demand for fire protection. The domestic demand in Columbus will average about 700 gallons per minute.

Q. You get at that from the——

A. (Interrupting.) What they are consuming now.

The MASTER: That means with its present population?

677 A. Yes, sir. The fire service in a city of this size, we calculate that the department shoud be able to use about 10 fire streams. It is seldom equipped sufficiently to use more than that or as much as that. The City of Columbus has three engines that would enable them to handle six streams from the engines. Ought to be supplied with enough to give ten streams, I think. Now that would be about 1600 gallons per minute. So that in calculating for this city, I should place their requirements for the next decade or more at about 2500 gallons per minute, or three and one half million gallons per day. The pipe system should be adequate to deliver that with comparatively small friction loss; and it is on that basis I have made these calculations.

Q. That's the basis of the calculations you have made?

A. Yes, sir.

Q. Mr. Boardman, where you use 4 inch pipe:

The MASTER: Before you get off of that: There is a question that I would like to ask the witness, that is, whether he has taken into consideration in his proposed extension of this system, any provision for what is known as the Annex on Rose Hill and the section of the city on the East Highlands?

A. Called for extensions: There is a six inch pipe coming from the 16 inch main that will go into the section over on the Highlands—over in that portion of the city and tie up an outlying section there now, so that will increase the pressure there. As the city grows other mains can be put in tying up the mains already there or extending the mains already there so as to give good re-

678 sults. There seems to be only a few hydrants there at present; and I concluded that this additional six inch main would of course for a number of years give them sufficient water.

The MASTER: How about Rose Hill?

A. That is part of Rose Hill. That is a part of the Rose Hill system.

The MASTER: I thought that had reference to East Highlands?

A. Now perhaps I don't understand where East Highlands are located. That out there (referring to map), a continuation little east of Rose Hill is called East Highlands.

The MASTER: Yes.

A. That's where I had reference to.

Q. You had reference to the Annex and that whole portion of the city?

A. Yes, sir.

The MASTER: If you had reference to the Annex that included it?

A. Yes, sir.

The MASTER: You were speaking with reference to the boundary lines of the city?

A. Yes, sir. I had reference to the section there embraced within the city limits.

(By Mr. WIMBERLY:)

Q. You spoke of not being many hydrants there: What is the effect of the distance of the hydrants apart as to ability to give a considerable number of streams?

A. Well, the further the hydrants are apart, the fewer streams can be put upon the fire and the greater the friction loss in
679 the hose. It is a mistake to place fire hydrants more than 400 or 500 feet apart; because when you get over 400 or 500 feet of hose, the friction loss is so very large you will cripple any water works system and cripple your fire department.

Q. When you have longer hose than that, you have to re-enforce it with engines?

A. Yes; and frequently by using Siamese nozzles, so as to get sufficient water at distant points with less friction.

Q. Explain what you mean by Siamese?

A. Two lines of hose are carried either from the steamer or from a hydrant to a point near the fire. At that point these two lines of hose are joined together by a coupling having two openings in the direction of the steamer and one opening in the direction of the fire, to which one line of hose is then attached—one short line of hose to enable the firemen to carry it about without undue weight and manage the fire too; but the water from that stream has only half of the water that goes through each line of hose; so that the friction loss in the whole stream is reduced eight times. It is only ⅛ of what it would be in a single line of hose.

The MASTER: Has the same effect, as you explained, as in tying together the system pipes in the ground?

A. Yes, sir.

The MASTER: Have you taken into consideration, in connection with these proposed extensions, any improvements in the present system that the Receiver has perfected, up to this time, at
680 the filter station: In other words: Major Greene testified here, my recollection is, that he purchased certain land above Bibb City; and he spoke of the possibility of the establishment of a pumping station up there and putting in a main to supply or supplement the present filter system—about that in substance: Now I want to ask you if you have considered in these contemplated improvements you suggest, anything in connection with that idea of improvement?

A. I have.

Mr. WIMBERLY: State about what plans you have considered on that line?

A. There is some objection to taking the water in the immediate vicinity of the present pumping station, because of certain streams running in above that point that take in the drainage from certain streets, etc. I have therefore made some surveys and calculations for taking the water supply at a point above any possible contami-

nation; and my suggestion was that a pipe be extended up the river to a point beyond contamination and take the water from that point and delivered it into settling basins at the pumping station and get rid of any objection on that score. It is practicable and can be done with comparatively small expense.

Q. About how much additional expense?

A. I suppose—according to the distance it was ultimately determined to get it, from $17,000. to $30,000.

Q. It would depend upon how high up you would go?

A. Yes, sir.

Q. About what size pipe would you use to bring the water down that distance?

A. 20 to 24 inches.

681 Q. The further you would go up the larger pipe you would need?

A. Yes, sir. That would deliver about five millions gallons per day.

The MASTER: To do that would remove entirely from the system as at present the pump at the pumping station at the foot of 17th Street—the suction from the river?

A. Yes, eliminate that entirely; and pipe should be placed there for a sufficient length of time. It is much easier to extend and enlarge mains in the city and your pumping station than it would be to enlarge your supply.

Q. You could use that in addition to the present reservoir supply?

A. Yes, sir.

Q. To supplement that in dry seasons if the city's growth required it?

A. I would recommend, as far as practicable, until it is necessary to get a larger supply, that the present Alabama supply be utilized as far as it will go. It is a very fine quality of water and comes from a sandy soil. Its water-shed can be entirely protected and it costs less to filter it; and for that reason it is more desirable as far as it will go; and if the Alabama supply were to fail or not be sufficient, there is no stream within practical distance that is comparable to the river, taking all things into consideration.

The MASTER:

Q. Would you say the present reservoir system, in its normal condition, is sufficient for this city?

A. I think, sir, they are; but even now the city at certain months in the year would require additional supply.

682 Q. At any rate to provide for the future, you would recommend supplementing the present reservoir supply?

A. Unhesitatingly.

Q. I will ask you: in enlarging the supply, whether it is practicable to get that increased supply by enlarging the size of the reservoir?

A. O, yes, it is practicable. You can also get a larger volume of water in storage there by building another dam lower down the stream.

Q. Take the reservoir supply, how is the supply from a local stream as compared with the river as to being affected by local droughts?

A. It is more apt to be affected by drought, because its drainage area is circumscribed, being located on one part of State, which is of course more subject to drought than the general State at large.

Q. In speaking of a reservoir capacity, is there any practical limit of proportion between the size of a reservoir and the size of a stream that supplies it?

A. We consider it not practical to put a very large reservoir on a small stream, because stagnant water is sooner contaminated by vegetable bacteria, where there is not enough water flowing into it. It should have a certain amount of circulation, a certain amount flowing in and a certain amount flowing out.

Q. If you were to get a reservoir too big as compared with the size of the stream, there would not be the required circulation?

A. O, no. The whole water would become foul. I had an instance of this kind in Kentucky, Richmond, Ky., where it is not practicable to get a supply from a large stream. We had to
683 take a stream that is practically dry for 2 or 3 months in the summer. For that reason we had to erect a large impounding reservoir from which to draw the water during the time when the stream was dry; and we had a great deal of trouble in keeping the water in a state fit for domestic purposes, because of the rapid growth of algæ, and while not unhealthy, algæ would form and get into the pipes and as soon as it was shielded from the light, by being in the pipes, it would die, process of decay would set in and it would become very offensive to the smell, which we could only remove after considerable trial and investigation by thorough aeration of the water before distributing it, besides filtration.

Q. This algæ, is it especially unwholesome or just offensive?

A. It is very offensive but I don't know that it could be called unwholesome, still, might be. People would not drink it and would not use it.

Q. Because of the odor of the water?

A. Like decayed fish.

Q. Take the drought of 1902, if you had a reservoir on a small stream like that that had practically dried up, would it be practicable to keep that water pure and not stagnate?

A. I think that question was answered by the experience of this company. Before the reservoirs were empty the water was in such a condition it could not be used.

Q. Wasn't the lack of reservoir space but the stream dried up, was the trouble?

684 A. If the reservoir had been twice as large the result would have been the same probably, only a little postponed.

Q. The mud would be exposed when the reservoir began to drop down, even though the water did not entirely leave it?

A. Yes, it would become warm throughout and the whole body foul.

Q. With the system that you propose, what would be the greatest

distance that the four inch mains would run between one of the cross mains to the next: I mean you would have them cross at what distances?

A. The greatest distance would probably be 1200 feet.

Q. If the distance was 1200 feet apart, that would put the farthest distance of a hydrant from either of these cross mains how many feet?

A. Six hundred feet. That would be equivalent to taking only half the water for that hydrant through each of this 600 feet of pipe. In other words: the friction would be reduced ⅛th, if it came only from one direction.

Q. Now you speak of the friction being *⅛th* as much, explain how you get at that: As you increase the velocity—how does the friction increase?

A. The friction increases as the cube of the velocity.

Q. I believe I was questioning you about the 4 inch mains the conditions as testified under the proposed change: They would be tied up every 1200 feet?

A. I said that would be the longest distance. Most of them would be at shorter distance.

Q. You mean it would make the hydrant at mid-way point between at the maximum distance of 600 feet?

A. Yes.

685 Q. That would be the maximum distance of *an* hydrant from the larger mains?

A. The four inch mains.

Q. How would the efficiency of one of those four inch mains tied up at both ends compare with a dead-end on a four inch main?

A. The friction loss of water coming from only one direction would be eight times more than if it came from two directions.

The MASTER: I thought you said under the proposed changes that you suggested the four inch mains were to come up?

A. A good many of them would come up.

Q. Now let me see then: As I understand it, you really increase the efficiency of the four inch mains eight fold by tying them up at both ends?

A. No, you reduce the friction loss.

Q. You reduce the loss in going through that four inch main *⅞ths*?

A. Yes.

Q. Now Mr. Boardman, take the portion of the city where you would leave the four inch mains at short distances, can you figure out what the actual loss would be, say you take two streams—I believe that is as many as a hydrant is supposed to furnish—take one of these hydrants located at the greatest proposed distance between each one, putting two streams on it, how much would the loss of pressure be, speaking first how much it would be without the use of an engine?

A. The friction loss of the two streams, furnishing three hundred gallons per minute, would be 3 83/100ths pounds for each 100 feet of length.

Q. That's where it flows from both directions?

686 A. No, only one direction. Would be 3 83/100 pounds per 100 feet. Take 600 feet, the loss would be about 23 pounds.

Q. Take it coming from both directions?

A. Take it coming from both directions it would be 69/100ths of a pound per 100 feet. The friction loss would be 4 14/100ths pounds for 600 feet.

Q. So with a four inch main you would have two good streams and you would only lose a little over four pounds?

A. Yes, sir.

Q. The loss would be only ⅛th of what it is now where it is on a dead-end?

A. Yes, sir.

Q. Reduce it ⅞ths?

A. Yes, sir.

Q. Take the pressure that you would get by bringing this large main down Third Avenue—you are familiar with the height of the Rose Hill standpipe—that ought to give you where it goes into one of these four inch mains in the lower portion of the city about how many pounds pressure?

A. The approximation would be about 8th or 9th Street, along there. The pressure along 9th Street would be where the small pipes come off: would be 62 pounds—62¾ pounds; and the loss to the hydrant would be 4 pounds more, leaving about 58 pounds.

Q. So with this proposed plan the loss from four inch pipe would be comparatively slight?

A. Yes, sir.

Q. Comparing these with the pressures furnished under conditions such as exist at Macon—at Columbus, what would you say as to the effectiveness of this proposed system with the changes that you would make it?

A. I think with these proposed changes, every hydrant in the city would give sufficient water for the system with very little

687 friction loss.

Q. Under the original contract with the city, the pressure that was contracted to be given was such as would be due to gravity pressure of 107 feet, if practicable,—not less than 100 feet and if practicable 107 feet, taking the most favorable portions of the system under the contract, what would be the ultimate limit of pressure that could be gotten with that height of head?

A. 107 feet?

Q. Yes, sir? And had to traverse a distance of four miles before it would be ready to be distributed?

A. Affect it very seriously.

Q. Give it both ways: first without the four miles and then with four miles?

A. If it had a height of 107 feet at the point of delivery, the pressure would be about 46 pounds.

Q. That would be the maximum if it had no friction loss at all?

A. Yes, sir.

Q. If it had to be conveyed through four miles of 12 inch pipe?

A. At the present consumption of the city, not the then consumption, because I don't know what it was then, but at the present consumption of the city it would furnish the hydrants with two good streams of water, through four miles of pipe, at an elevation, the reservoir, of 107 feet, you could not get over 20 pounds pressure.

Q. So without these additions in the way of standpipes and improvements, that's what they would have originally gotten?

A. What they would get now.

Q. Would not be over 20 pounds?

688 A. With the present consumption.

Q. Without regarding the consumption at all, making no allowance for domestic consumption, but making an allowance for loss in going through four miles of pipe, how much would that be?

A. Just to supply two streams?

Q. Yes, I want to get it each way?

A. Thirty eight pounds.

The MASTER: The difference between 46 and 38?

WITNESS: Would be the loss in friction.

Q. Under the present system with the filter plant that you have: I will ask you whether the filter plant will admit of enlargement without rebuilding—can it be enlarged?

A. Yes, it can be enlarged by adding on units—filter units.

Q. As the city grows from time to time?

A. It can be added to.

Q. Without changing its general design?

A. Yes, sir.

Q. You spoke of what you would recommend as to the system: I will ask you as to the pipe themselves, the condition of the cast iron pipes: What effect would 10 or 20 years use on cast iron pipe be?

A. Well, cast iron pipe, such as are used in Columbus, are coated with asphaltum, a preparation that preserves them for a much longer period than they otherwise would be. I have taken up pipe that was down for 14 years and after brushing off the dirt the pipe could not be distinguished from new, except for a slight deposit of rust—little iron rust and mud on the inside. The outside was fresh with the dirt off.

689 Q. Does that little deposit of rust on the inside appreciably affect the pipe, that is, its strength?

A. Not appreciably in 10, 12, 15 or 20 years. I have know- pipe to be down nearly 50 years——

Q. What is considered the life of cast iron pipe?

A. Have not determined what the life of it is yet. This asphaltum preparation has not been in use much over 50 or 60 years; and don't know what the life would be. It is greater than any experience we have had.

Q. Experience is not sufficient to say what its limit would be?

A. No, not yet.

Q. I suppose you have refreshed yourself in a general way as to this affidavit: Have you examined the system and can you state in a

general way as to the system now, the size of pipe, distribution and so on?

A. I have tested it only in a few points. At those points the sizes of the mains were as indicated in the map; and the pipes showed a very good state of preservation.

Q. I will ask you what you would say as to the value of the present system as an integral part of an enlarged system, such as you propose?

A. I should not advise dismantling it except in those places I have indicated and put in larger pipe, only taking up the small pipe in those places. The whole system can be made useful by these improvements—made exceedingly useful; and it would be a sinful waste of money to go to the expense of taking up these pipe for the purpose of putting in larger ones.

Q. Can you re-enforce the system, in other words, without
690 taking up the pipe?

A. You can re-enforce the system without taking up any pipe; but I would take up the small pipe where the larger pipe would go down and use them in future for extensions.

Q. You would do that merely to save that pipe for future use?

A. Yes, that's all. Might be reasons for leaving the smaller pipes. You could supply residences and other customers off the smaller pipes and place the fire hydrants on the larger pipes.

Q. As I understand it, as the city grows and the necessities of the town grow, you can then meet the necessities by taking it out or by re-enforcing what you already have?

A. By re-enforcing those portions that are needed. Take up only this pipe where the re-enforced pipe lines may meet with—meet the other pipe already in position. Generally prefer to use that pipe for extensions. Take it out and use it elsewhere.

Q. Something has been said as to an estimate of the cost of the present system. In figuring the cost of a system, what elements do you take into consideration?

A. We first get the quantity of pipe, the number of valves, hydrants, appurtenances and cost of the machinery; and then we add to that the cost of installation, that is, cost of excavating, cost of laying the pipe, time it takes to cork joints, excavating trenches and re-filling trenches, re-placing pavements, running surface pipes, cost of pipe, cost of trenching and filling in, putting in the valves, cost of installing the machinery, building foundations, making connections
between engines and boilers, installation of boilers, erection
691 of smokestacks and buildings——

Q. When you get the cost of all those component parts, do they represent the entire value of the system?

A. O, no; not as a going concern. It bears the same relation as a building which is built and is being rented does to the material that went to build it, brick, sand, etc., as to what the value of that would be.

Q. So as a going concern how would you estimate the value of a system?

A. Estimate first its structural valuation, to which we add its

value as an earning organism, you might say. The earning capacity is a large factor in determining the value of a complete water plant.

Q. In '81 and '82, was the attention given to filtration then as is now done?

A. I don't know of any city in the south that was then filtering its water.

Q. In speaking of the sizes of the mains themselves, an ordinary fire hydrant is what size inside—clearance inside?

By the MASTER: Before you get on that: Mr. Boardman, what is your estimate of the value of this system as it now stands in Columbus?

A. I have made no estimate.

Q. You have not?

A. No, it would require a rather exhaustive examination. I don't know the dif-erent lengths and the different sizes of the pipe sufficiently accurate to estimate their value.

Q. Did you make any estimate of the probable cost of the proposed improvements that you have testified about?

A. Yes, sir.

Q. How much would you say it was in dollars?

A. To re-enforce the mains of the system would cost some-
692 thing in the neighborhood of fifty thousand dollars.

Q. Is that exclusive of what has already been expended by the Receiver?

A. Yes, sir; and any extension of the main up the river, exclusive of that. That's just inside of the city limits, to put this present system in a condition that I think it should be to meet the city's demands for the next 12 or 15 years. It would take about $50,000.00.

Q. In addition to what has been expended by the Receiver?

A. Yes, sir.

Q. You made no estimate of the probable cost of these suggested extensions up the river?

A. Yes, it is from $17,000. to $35,000.

(By Mr. WIMBERLY:)

Q. That would depend upon how high up the river you would go?

A. Yes, and the amount of water you would want to bring down.

Q. I understand your calculation of these expenditures, the amounts you have named, the present system could be put in such a condition as would supply this city for the next 12 or 15 years—Did you say 12 years?

A. About 12 years.

Q. It would then be in a position for further extensions?

A. Yes, sir; further extensions and further improvements.

Cross-examination.

(By Mr. WIMBISH:)

Q. In your estimate did you include anything for changes in the Annex?

A. Yes, all in the city limits, the present system; but not
693 for any future extensions that might be demanded. Didn't include any pipe that in the future might be demanded, just what was necessary to make the system now more efficient.

Q. Have you made any estimate of the amount for which the present system could be duplicated, not including the filter plant?

A. No.

Q. You have not?

A. No.

Q. The cost is a fixed quantity and you could do that?

A. I could make an estimate of that, yes.

Q. The value of a plant, according to your definition, includes franchises and good-will, intangible matters of that kind?

A. Includes the earning capacity, which I think is not included in the franchise, but might be included in the good-will, as you say.

Q. Those intangible elements?

A. Yes; and also another element that I might mention, that of cost of money during the time of construction and until such time as the works can take care of itself. Those are proper charges against construction.

Q. The value is very problematical, isn't it? You can't get at it with any degree of definiteness? Financiers might differ about that?

A. Experts differ on that.

Q. There is no certain way to arrive at values, at best it is only an opinion?

A. The practice is to arrive at it as I say.

Q. But I want to know as a matter of fact if it is not really an opinion at last—must be?

A. No, sir; unless you take into consideration those intangible quantities. Those are matters that must be decided by con-
694 ditions of the place and the actual material in the works.

Q. But each man is entitled to his own opinion and judgment as to what the value is?

A. Yes, sir. The more experience he has the better fitted he is to judge.

Q. You say if the water is taken up the river, at a point above the present source of supply that you would recommend a pipe of from 20 to 24 inches?

A. Yes, sir.

Q. Why do you recommend so large a pipe?

A. Because the head is so small and the flow of water to be obtained is so little, you want a large pipe to force enough water through it to reach the desired height at the filter basins.

Q. What, in your opinion, would be the proper size of pipe from the present reservoir, is the 12 inch pipe sufficient?

A. I think a 12 inch pipe will bring about all that the reservoir will supply for a permanent supply.

Q. You think it will bring about two million gallons per day?

A. No, not that much.

Q. How much will it bring?

A. I think it will bring or deliver about 1,250,000 gallons.

The MASTER: You say the head would be so small you would want this large pipe? Didn't I understand you to say that?

A. Simply drawing it from the river without a pumping station, just have it to flow into the supply basins by gravity, the smaller pipe would not do. If you put a pump in at the upper station, then there would be an expense for that.

Q. Your proposed plan does not include a pumping station
695 up there?

A. No, I advised against a pumping station, but to bring it down by gravity.

Q. I understand you to say that the present 12 inch main would deliver in Columbus as much as the present source of supply will furnish?

A. I think the average supply would furnish enough, taking it through the entire year,—that pipe will furnish about as much as that stream will.

Q. In other words: the stream to the present source of supply will furnish about 1,250,000 gallons per day?

A. Yes, sir.

Q. I understand you to say that this city should have an available supply of three and one half millions gallons per day?

A. Should have a source sufficient to supply that and its mains should be equal to deliver that amount if needed.

Q. What size main would be required to deliver that amount of water per day, say from the reservoir, if you had it there?

A. From those reservoirs?

Q. Yes?

A. About 16 inch main.

Q. How much larger could those reservoirs be made so as to accommodate that size stream and give a good quality of water: Do you know their present capacity?

A. I have an approximate idea of what it is. Made an approximate calculation. Didn't make an exact calculation.

Q. What is your estimate?

A. I think the upper reservoir is about 39 millions and the lower reservoir about thirteen millions.

Q. How much could the capacity of those reservoirs be in-
696 creased?

A. I think the upper reservoir by raising the dam ten feet might be doubled.

Q. That would give?

A. About eighty million gallons.

Q. How much could you increase the lower reservoir?

A. Could not increase the lower.

Q. Why not?

A. It already backs up. It would overflow.

Q. You could, couldn't you, erect a dam lower down the stream?

A. Yes, lower down.

Q. And enlarge it?

A. Yes, might enlarge the reservoir lower down.

Q. How much could you increase the capacity?

A. I think you could get a reservoir capacity lower down there or two or three hundred million.

Q. I don't mean that: I mean commensurate with the size of the stream in the upper reservoir?

A. I think if you were to double that reservoir you would get about the limit. I would advise for that stream, I would not want to put in more reservoirs on that stream.

Q. There would be 80,000,000 gallons in the upper reservoir and 13,000,000 in the lower reservoir?

A. Yes, sir.

Q. That would give you 93,000,000 gallons in storage?

A. Yes, sir.

Q. Would not that have been sufficient to have supplied this city in the past in seasons of drought?

A. I hardly think it would. I don't think it would have supplied it during the last drought that existed in 1902.

Q. Well now, suppose the upper reservoir had been constructed with marginal edges or marginal depths of at least four feet all around, with proper device to keep the sand and mud from
697 flowing in, whatever might have been necessary, would that have improved the quality of the water in storage?

A. I don't think it would have made much difference. The water was not hurt by the vegetation that was in it. It was hurt by the lack of circulation. No new water coming in.

Q. Not speaking of 1902, speaking generally?

A. Generally?

Q. Yes?

A. Well, of course the deeper it is the longer it takes to contaminate the water; but when the size of the stream is so small that the body of water in the reservoir does not get proper circulation by bringing in new water, the oxygen in the standing water becomes consumed by vegetation and fish and such things and it becomes spoiled long before it is exhausted.

Q. As I understand you: no practical method could be adopted or could have been adopted, by which that source of supply would have been sufficient to have furnished this city with pure water in 1902?

A. I don't think that stream could have been made to have furnished the water at that time even with a larger impounding reservoir; because, as I say, the water would have become unfit for use before it was exhausted.

Q. Then I understand you to say that stream is too small to furnish the city?

A. That stream is too small, in my opinion, to furnish the city now or within the near future. There would be some months in every year, even an ordinary drought, where you would have to get some water from the river, as it stands now.

Q. Are you familiar with the Stewart Spring?

698 A. Yes, I know the Stewart Branch.

Q. Suppose there had been constructed an impounding reservoir on that branch as a supplement to the other source of sup-

ply, and they had increased the size of the existing reservoirs so as to hold 93,000,000 gallons, would that combined source have been sufficient?

A. I think it would have been sufficient for that time, that is, to have tided over that particular drought.

Q. That was the most severe drought you have known of?

A. Yes, sir.

Q. You have read the specifications in the contract with reference to the filtration provided therein, that is, percolating the water through sand and gravel and other filtering material, wouldn't that very materially improve the condition of the water?

A. No, would not have affected the contamination of the water that existed at all. It would not have been eliminated by such a strainer.

Q. What would have been the effect of that filter plant?

A. Merely have taken out any floating leaves, sticks and probably a small amount of silt.

Q. Would it have removed the mud?

A. Might have removed a portion of the mud; but if it had been constructed as it was provided to be constructed, there were no adequate means of cleansing that filter. It would soon have become foul all the way through. Would be very little cleaning. It would wash in at one end about as much as it would take out at the other.

Q. Did I understand you to say in '91 filtration was then in use in any of the Southern cities?

A. In '91 it was begun to be used in some of the western
699 and northwestern cities. I think in '91 I was one of the pioneers in using it in the southern cities.

Q. You used it successively in '92 in Macon?

A. Yes, sir.

Q. It would have been practical then to have filtered this water as you did then in Macon?

A. O, yes.

Q. Could have been done?

A. Could have been done.

Q. Suppose in '91 the most approved filter plant that was known or in use had been adopted, and the upper reservoir had been constructed — as to have marginal depths of four feet, and had had protection from surface washings, storm water, etc., and had been increased in size and capacity, and all vegetation kept down and removed, what would have been the effect of that on the quality and quantity of water furnished this city?

A. The quality and quantity, if it could have been kept full, would have been all that was necessary and there would have been no complaint.

Q. The quality after filtration would have been perfect?

A. Been all right.

Q. That could have been done in 1902?

A. If they had had water to have kept the reservoir full, yes.

Q. I am speaking of the conditions as they exist with the present system and the addition of the Stewart Branch.

A. I think with filtration the water could have been made free from contamination; but it still would have had some odor, which would have been objectionable.

Q. Filtration does not remove odor?

700 A. No, sir.

Q. What is the odor due to?

A. The odor is due to gases contained in the water.

Q. What produces those gases?

A. Frequently by formation of algæ in the water, and things of that kind. While they are removed, the odor exists; and frequently have to employ other means to remove the odor from the water; and even when they are not detected by chemical analysis or bacteriological analysis, the odor obtains in the water.

Q. Some of the substance must remain in the water?

A. No, it is gas.

Q. A form of gas?

A. Yes.

Q. Is the gas a- deleterious as the substance?

A. No. No microbes in gas.

Q. Only offensive to the smell?

A. Yes, sir.

Q. Now I understand you to say the drought of 1902 was a very serious one?

A. Yes, sir.

Q. Do you re-call when it began, what season of the year?

A. My recollection is that after the middle of April, or the latter part of April, there were *vew* few showers even and no rains of any consequence until away along in October.

Q. Was the effect of that drought such as to have exhausted this supply as early as the middle of July?

A. I should think the stream would have been very much diminished by that time. I don't think it would have gone dry though before the middle of August. By that time I think most of the streams——

701 Q. (Interrupting.) This water was abandoned early in July and river water pumped into the mains?

A. So I understand. I was not here at the time. I understand it was.

Q. You were here about the first of September?

A. Yes, sir.

Q. Was that stream entirely dry or a small stream running into the reservoir then?

A. Entirely dry.

Q. I believe you stated that you considered the water utterly unfit for any purpose then?

A. At that time, yes.

Q. How long did that condition continue?

A. I don't know that. I was not here when they had the rains that filled it up again.

Q. Did you make a report to your employers in this matter?

A. Yes, sir.

Q. Have you a copy of that report?
A. I have not.
Q. Who did you represent in the work?
A. I represented the bondholders.
Q. You referred to a contemplated source of supply above Bibb City: You propose to erect a stand pipe there?
A. No, take the water from there.
Q. And take the water by pipe down the river?
A. Yes, sir.
Q. Have you submitted any plans?
A. I have had some surveys made and got certain elevations.
Q. Is it true that they have bought some land up there?
A. Yes, sir.

Q. What is the purpose of buying the land if they are not
702 going to erect a standpipe?

A. The purpose in buying the land was to secure the right to the water from the river and to erect any wing-dams, or things of that kind that might be necessary to throw the water in. It was also thought — might possibly move the station up there and pump the water to the city after filtration.

Q. It is not contemplated to erect a standpipe up there?
A. No.
Q. Reservoir or standpipe?
A. On the river? No, not on the river.
Q. Do you regard the present system—distribution of the mains in this city sufficient?
A. I do not.
Q. In your proposed change you would not abandon all the four inch pipe?
A. No, it is not necessary.
Q. How much would you leave—what proportion—how much in feet?
A. I have not calculated that, sir. I would leave that on which one hydrant is located, so that it could be re-enforced at both ends. On which one hydrant is located, four inch pipe and re-enforce it at both ends at distances not greater than 1200 feet.
Q. You would do away entirely with dead ends?
A. Almost entirely. There are 2 or 3 dead ends that it is not necessary to do away with on some six inch pipe.
Q. Have you any general idea of the value of the pipes and material in the city in the distribution mains?

A. No, I have not made any calculation of that. Really,
703 I don't know the quantity.

Q. You don't know whether your estimate of $50,000. for supplying new pipes and additions would exceed the value of that already in the ground?
A. I am pretty sure it would not. It is something like a lawyer's opinion of a case he has been over so often with a certain amount of facts before him. From the map before me and the sizes laid down on it, I am engineer enough and have gone over these sort of esti-

mates so much as to be positive that there is more pipe in the ground, according to that map, than you can cover with $50,000.

Q. What would you say would cover the value of the pipe in the ground: Isn't the value controlled largely by the size?

A. O, yes, largely by the size. I could not and would not be willing to say that it is worth so many dollars.

Q. I want to get your estimate in a general way, not by any inventory?

A. I think the mains in the ground here might be put in for $150,000., the mains alone.

Q. The mains alone as they now stand in the old part of the city?

A. Yes, probably $150,000., to which should be added the valves, hydrants and things of that kind, and connections—the value of them.

Q. What should be added to that?

A. I should think somewheres about $50,000. Service pipes, connections, stop-cocks, and so on.

The MASTER: I didn't quite catch that question?

Q. So the aggregate would be $200,000?

704 A. Yes, sir.

Q. What value per ton do you put on the pipe?

A. The value of a ton of pipe delivered on the cars here is about $26.

Q. Now?

A. Yes, now, the average.

Q. How does it compare with what it was in '93?

A. '93?

Q. Yes?

A. I think it is a little lower.

Q. A little lower than it was in '93?

A. Yes. I think in '93 it was about $28.

Q. What do you regard is the necessary pressure in pounds—fire pressure, to efficiently fight fires in this city?

A. Well, 40 pounds is considered a very good pressure at a hydrant.

Q. That, in your opinion, would be sufficient to furnish how many fire streams?

A. Forty pounds at the hydrant would supply two streams from each hydrant.

Q. If they were located on different mains or on the same mains?

A. That's for the hydrant itself.

Q. Supply two streams from one hydrant?

A. Yes, 40 pounds at a hydrant would supply those streams.

Q. Three hundred each, six hundred for the two?

A. A fire steamer does not take more than from 160 to 200 gallons per minute for fighting fire on buildings as low as these. About 160 gallons per minute is the average.

Q. Would you call 20 pounds sufficient?

A. No, not for fighting fire.

Q. Gravity pressure—You would consider 46 pounds sufficient?

705 Q. Yes, I think anything above 40 pounds is sufficient.

Q. Gravity pressure of 107 feet is 46 pounds?

A. Yes, sir.

Q. If the source was four miles distant, delivered through a 12 inch main, it would reduce it how much?

A. Reduce it to 20 pounds with the present consumption by the city.

The MASTER: 38 without consumption?

A. About 38 without consumption.

Q. Thirty eight without any consumption?

A. Yes, sir.

Q. And 20 with the consumption the city now has?

A. Yes. Supply about 500 gallons per minute. That gives more than two streams of course. That would be equivalent to three streams—three good fire streams. About 500 gallons per minute you would get from 38 pounds pressure.

Q. I understand you to say that 500 gallons would supply three good fire streams?

A. About three.

Q. Have you had any practical experience in fighting fires?

A. Yes, sir.

Q. With your proposed 16 inch main from the Rose Hill standpipe, you come down Hamilton Avenue and then you bend at 17th Street and go to Third Avenue?

A. To Third Avenue.

Q. What effect do those angles have on the pressure?

A. Have very little effect.

Q. Yet you would make a right angle?

A. No, a bend.

Q. Make a bend?

706 A. Yes, make a bend. The larger the radius the less the friction, of course.

Q. If this city is using a million gallons of water per day, would a million and six hundred thousand gallons be adequate in case of a fire or extraordinary uses of water?

A. Yes, sir.

Q. That, as I understand, is the capacity of the filter plant from the river?

A. If all the water is taken from the river, yes. You start out generally with considerable water in your standpipe. If a fire occurs you start out with your standpipe practically full.

Q. If it is full?

A. Yes, and it should be full.

Q. I understand with your improved system the loss in pounds of pressure from Rose Hill to 9th Street would be about 13 pounds?

A. About 13 pounds.

Q. What is the pressure now from up there with six inch main you have: Is it reduced four times as much?

A. Yes, more than that—good deal more than that.

Q. It is reduced more than 52 pounds?

A. For the same amount of water through it I should think it would be. I don't think you would get much pressure trying to deliver 2500 gallons per minute upon that one six inch main.

Q. Can you say what would be the pressure from Rose Hill standpipe at 9th Street under the present system?

A. I could calculate it. It would take some little time.

707 Q. I won't ask you to stop to do so now but if you have time at the noon recess I would be glad to have you do it?

A. At the intersection of Third and 9th Street? To deliver how much water?

Q. Take it as it exists?

A. Well, my estimate was, you know, upon the basis of delivering at Third and Ninth, at 2500 gallons per minute. That is much greater than there is any need for, under the plan I call for.

Q. I want you to take it as it exists. You can see the sizes of the pipes down to 9th Street and say the corner of Third Avenue?

A. The friction loss depends upon the quantity of water flowing; and it varies.

Q. Give me the pressure for two fire streams there, say 600 gallons?

A. Five hundred gallons would be——

Q. I would prefer that you give it to me at 600 gallons. That is what's used in the city?

A. You can only get it by engines.

Q. You say Chester, Pa., used water from the Delaware River for years without filtration?

A. Yes, sir.

Q. So did Newark from the Passaic River?

A. Yes, sir.

Q. Do you recommend the use of those river waters without filtration?

A. No, I should filter them. I would recommend filtration now of water from any river.

708 Q. I understood you to say that there was no appreciable increase in sickness in Chester and Newark because of their water supply?

A. I said there was no complaint from Chester in regard to its water supply. I think there was in Newark.

Q. Why was the water abandoned in Newark? Why did they change their source of supply?

A. Because the Passaic River became too foul for use.

Q. Where do they get their supply now?

A. They get their supply from the Raritan Water-shed, Raritan River water-shed. It is brought down in large mains to supply cities through that section.

Q. Is it from the river proper or only from the water-shed?

A. The water-shed.

Q. What is the distance to Newark?

A. I don't know. Quite a number of miles.

Q. Fifty miles?

A. I don't think it is fifty miles, probably 25 or 30 miles, I should imagine. I don't recollect the exact distance. Some distance.

Q. What is the size of Newark in population?

A. Newark must have a quarter of a million people in it.

Q. Hasn't it more than that?

A. May be, I don't know.

Q. Then we have a city ten or fifteen times as large as Columbus that is getting its water from a stream other than a river?

A. O, yes. From the water shed of the stream.

Q. There are a good many rivers convenient to Newark, as convenient as its water shed?

709 A. There are some rivers of less distance.

Q. If river water under the present methods of filtration can be made as pure and good as spring water, or water of small streams, why is it that Newark goes such a distance for its water?

A. I think she found she could get it cheaper than by filtration. They buy it from a water company. It does not own it.

Q. That water is not filtered?

A. That water is not filtered.

Q. How about New York City supply, she goes some distance for its water and gets it from a small stream and owns the water shed?

A. It owns the water shed. It is comparatively small stream.

Q. She owns the water shed?

A. Yes, controls the water shed.

Q. Where does the City of Albany get its water?

A. I don't know.

Q. Where does the City of New Orleans get its water?

A. Gets it from the Mississippi River.

Q. Is it filtered?

A. Attempted to be.

Q. They have not got a good system?

A. Have not succeeded yet.

Q. How about Memphis?

A. I am not familiar with Memphis.

Q. Are you familiar with the Mississippi cities, Vicksburg, for instance?

A. No. St. Louis takes it from the Missouri.

Q. Do you know where the City of Mobile gets its water

710 supply?

A. Yes.

Q. Where?

A. Part of it from a little stream about three miles from it, a little creek; and part of it from the Danville Water Company, some four miles away—small streams.

Q. That's one city that does not get its supply from a river in the South?

A. Yes, sir.

Q. Have they an artesian supply of water?

A. No. They could not very well take it from the river there.

Q. They don't take it from the river?

A. No. Can't filter salt water.

Q. Isn't it true that cities only go to the river as a last resort, because they can't get an adequate supply elsewhere?

A. No. It is a question not only of adequate supply but cost of supply.

Q. Either economy or necessity, one or the other, drives them to the river?

A. Yes, sir.

Q. They go there as a last resort?

A. They go there as the best source, taking all things into consideration.

Q. If there were an available supply from small streams, sufficient in quantity and of equal economy in cost, would any city go to the river in preference to a supply of that character and has any city done so?

A. Yes. Macon went to the river in preference. She could
711 have gotten it from small streams by taking quite a number of them.

Q. Why did you abandon your source of supply in Macon?

A. Because it was inadequate.

Q. You went to the river because your consumption there was inadequate?

A. The source we were using from was inadequate. We had to supplement it; and we concluded that it was more economical to take it from a larger supply entirely and filter it. These are questions that each city, according to its location, has to determine for itself.

Q. What I want to get at—because I want to get your opinion: other things being equal, would a city prefer a river supply?

A. Other things being equal it would prefer——

Q. (Interrupting.) Adequacy of supply, cost and all those sort of things?

A. It would prefer a clear water supply—gravity supply from a clear water stream above any river.

Q. Now I understand you to say that the water from the small streams, in the neighborhood of the river, contain water of the same character as the river; but the water shed of the river being larger—greater in area, the danger of contamination would be less from the river than from small streams, is that correct?

A. Yes, sir.

Q. What is the objection to river water on the part of so many cities and people?

A. Well, it is largely due to our minds affecting our stomaches.

Q. Imagination?

712 A. Yes, imagination of people who don't know, that is a large bulk of the people that are affected. Prejudice frequently controls such questions.

Q. If the water shed is greater in area and extent, is there not greater danger of contamination, if it is spread over a larger area than a smaller?

A. The reason why there is less danger is, because the volume of the stream is so great that contamination in any locality that would

affect a small stream will not affect a large stream so much in proportion. The chances of a general epedemic are much less than for an epedemic in a single locality.

Q. A single point of contamination will affect or pollute a small stream and will not a large stream?

A. Yes.

Q. But the larger the area you have the more points of contamination you have?

A. Yes; but the chances for the same number of points being affected is much less.

Q. In your opinion will filtration remove specific disease germs?

A. In the same proportion as it will all other germs, yes.

Q. Filtration does not remove anything held in solution?

A. No.

Q. I don't mean that disease germs are held in solution?

A. As a matter of fact they are not held in solution. Anything like salt, filtration will not entirely remove that.

Q. The effect of alum is simply to cause the solids to coagulate, so to speak?

713 A. Takes down all suspended matter and kills any germs—any living germs.

Q. The alum does?

A. Yes, sir.

Q. You kill the living germs by the use of alum and not by the sand separating them from the water?

A. The sand alone will not separate them from the water. Has to be coagulated first.

Q. Won't typhoid fever germs pass through the filters?

A. Only in the same proportion that other germs do.

Q. Isn't it true that epedemics of typhoid fever have occurred at places where the water was filtered?

A. I don't know of any. I know of cases where they did not.

Q. Do you know of the recent epedemic up in Pennsylvania—some town in Northern Pennsylvania?

A. No. I know in the Hamburg epedemic, where the filtered water supplied one portion of the city, an epedemic occurred on the other side of the stream where the water was not filtered; and it was only sporadic in that portion that was filtered; and those sporadic cases were traced to people who had crossed to the other side of the stream.

Q. I asked you if it is not true that typhoid fever germs do pass through filters?

A. I don't know whether they have or have not. I think that the same proportion of typhoid germs would pass through a filter as other germs. We don't claim to eliminate every germ but only 98 to 99 per cent.

Q. When you say "we" don't claim, who do you mean?

714 A. Filtration experts.

Q. Do you know of the epedemic of typhoid fever at Ithaca New York?

A. I know about it; but I have not made any particular study of it.

Q. Do you know what the source of their supply was up there?

A. Do not.

Q. Do you know whether that water was filtered at that time?

A. Was not at that time. They are putting in filters now.

Q. Wasn't their water supply from one of those clear water basins?

A. I think it was from a lake there.

Q. Do you know whether typhoid fever germs will multiply?

A. Yes, they multiply in certain waters.

Q. Under favorable conditions very rapidly?

A. Yes, sir.

Q. One source of contamination may bring about an extended epedemic?

A. Yes, sir.

Q. If typhoid fever germs were to pass your filter and get into your mains, under favorable conditions, they would increase there?

A. Not apt to increase there, no; but after they get into the body of a person they will increase.

Q. They don't increase unless they get into the body of a person?

A. I don't think they would in filtered water. Water that is not filtered there is a good deal of vegetable matter in suspension,
715 such as water in wooded districts and disease germs and typhoid germs increase. For that reason you will find in the mountains they have more than their due proportion of typhoid germs in their streams.

Court here took a recess for dinner.

Afternoon Session.

Court met pursuant to recess for dinner and the hearing was resumed.

(Examination by Mr. MARTIN, of counsel for the respondents:)

Q. Do you know anything about the epedemic that occurred at Butler, Pa.?

A. No, sir.

Q. Never heard about that?

A. No, sir.

Q. Do you know whether Butler, Pa., has a system of water works or not?

A. No, do not.

Q. What about Columbus, Ohio?

A. Columbus, Ohio, has water works.

Q. Have they got a filter?

A. Have not—I think not.

Q. Do you know where they get their water?

A. No, I do not. Not sufficiently conversant with that. Never visited those works. Don't think it has filters. I don't know, though—not sure.

Q. You stated this morning, if I understood you, that the reservoir here would furnish through this 12 inch pipe water for
716 two streams of 38 pounds pressure: what do you mean by two streams?

A. Well, I said would give 500 gallons per minute. That is a little over two streams.

Q. Whereabouts?

A. At any point, say on Broad Street.

Q. Does that contemplate that the pressure of the standpipe be used?

A. No.

Q. What effect does the Broad Street standpipe have upon it?

A. The Broad Street standpipe would eliminate the friction — the 12 inch pipe from the reservoir to the city, so long as it was maintained at its proper level. In other words: if the standpipe was there, the 12 inch pipe would keep the standpipe full up to the limit of its capacity, so there would not be much friction there until you dropped the water in the stand pipe some ten feet.

Q. The stand pipe being there, those two streams would be furnished and it would maintain its level with 38 pounds?

A. It would furnish what was necessary for those streams above what the pipe from the reservoir would furnish at that height.

Q. So when the stand pipe is full there is no water running from the reservoir?

A. No, when the stand pipe is full there is no water taken from the reservoir because there is no draught.

717 Q. As soon as the water in the standpipe begins to lower, the water runs in from the reservoir?

A. At the time the streams were called for from the hydrant, the pressure would be 46 pounds. There would be a gradual reduction in pressure at the hydrant until the pressure was reduced to 38 pounds, at which pressure the reservoir would maintain the supply of water for the hydrant through the 12 inch main. I think that's clear.

Q. That's clear now. From that point then the reservoir would supply it?

A. Yes, sir.

Q. Suppose there were four more streams added, making instead of two streams six streams. Now then, what would be the result?

A. If you had six streams?

Q. Yes?

A. Instead of say three.

Q. Instead of two. Let you start at that?

A. I said about three streams. Five hundred gallons I calculate would furnish about three streams. That would double the amount of water.

Q. How would that affect the pressure?

A. That would affect the pressure more decidedly and quicker. The water would flow in the standpipe that much faster so that in a shorter time the pressure would be reduced to that which the 12 inch main would give.

Q. Now how much would the 12 inch main give for six streams. That's the point I want to get you to, six streams of six hundred gallons each?

718 *Q.* The question that we are on now is a thousand gallons per minute instead of 500, as I calculated. The pressure would be reduced to 20 pounds gradually.

Q. How long would it take it to get to that point?

A. The standpipe is 20 feet in diameter. About three hours and four minutes.

Q. In that time it would reduce the pressure down to —?

A. To 20 pounds, yes.

Q. This calculation is based upon the fact that there is no water being consumed by consumers?

A. Yes, sir; based upon the fact of 600 gallons per minute.

Q. Suppose there is a consumption of water going on at the rate of 700 gallons per minute?

A. Well then, of course the friction would be greater; and it would be reduced quicker. Be reduced probably within an hour and a half.

Q. Isn't it a fact, that if there were 700 gallons being consumed a minute it would not start with 46 pounds, would it?

A. No, would not start with 46. Start with 38 pounds.

Q. It would reduce itself, starting with 38 pounds, with six streams, it would reduce itself very much quicker?

A. Yes, considerably quicker.

Q. That is taken at the most favorable point on Broad Street?

A. Yes, sir.

Q. Suppose it was taken at the Columbus Iron Works, 9th Street and Front?

719 A. The friction there would reduce the amount of water flowing so the hydrant would not deliver quite so much water as that.

Q. That much water would be necessary at a big fire?

A. Well, it would, if you had a steamer attached, might be necessary.

Q. Suppose there was a steamer attached so it would double the amount?

A. In that case there would be some little suction on the steamer and the steamer would get the water. The pressure would be reduced down there so the gauge would not show much pressure.

Q. The pressure over the city, if that was going on down there at that point, would be reduced very rapidly?

A. Very materially.

Q. To less than 20 pounds in an hour and a half if it was down there at that distance using steamers?

A. Yes, I should think it would reach 20 pounds in a little less than an hour.

Q. What is the effect of a four inch main being inefficient: How do you explain that?

A. A four inch pipe will supply a quantity of water at very much

reduced head; and the pressure at the hydrant would be very much reduced because of the friction on the pipe. In other words, if you start at one end of a four inch pipe with a pressure of 50 pounds, and you wanted to get a thousand gallons a minute at the end of a thousand feet, why you would not—if you depended upon that pressure to give it, you would find at the hydrant very much diminished pressure.

720 Q. Starting with 50 pounds?

A. Start with 50 pounds at the end, and go along, when you got to the hydrant you would find at the hydrant quite a decided drop in pressure. Get plenty of water from the hydrant on a four inch stream but at reduced pressure.

The MASTER: The- is because of the great friction on the pipe?

A. Yes, sir. We never think that it is wise to place over a 1000 feet of four inch pipe without tying it up at each end on any system. It is not wise and we don't like to put more than one hydrant on a four inch pipe.

The MASTER: Between connections?

A. On 1000 feet. However, we connect it at each end; and 1200 feet, connected up at each end, one hydrant is all that ought to be put on that pipe. If you are going to have two hydrants, we recommend six inch.

The MASTER: If you had an abundant pressure from the original source, the pressure would get the water through?

A. O, yes. It is not always economical to have a high pressure on the whole system on account of leakage and breaks due to high pressure. It is better to put in large pipes with less pressure on the mains.

Q. These calculations you have made and the answers you have given me about pressure would be given to the most favorable location on Broad Street and are based on a 12 inch main from the reservoir to the standpipe?

A. Yes, sir.

721 Q. Suppose that had been a 16 inch main, there would have been very much better pressure?

A. Yes, the pressure would have started the same but would have been maintained much longer.

Q. Now the pumps that pump into the mains supply the whole system?

A. Yes, sir.

Q. And at the same time pumps on Rose Hill?

A. Yes, sir.

Q. Suppose a fire should break out down town and the pumps were started all in motion, would you get any benefit of the Rose Hill standpipe?

Q. Not until the amount of water that you called for exceeded what you were pumping would you draw any from the standpipe.

Q. While you are pumping into the standpipe you are not drawing it out of there?

A. If you were pumping the same amount called for the water in

the standpipe would be stationary. Would not be any movement one way or the other.

Q. It would be the same as if the standpipe was located——

A. (Interrupting.) Located at the intersection of 17th Street and Third Avenue.

Q. What would be the pressure?

A. The pressure on it would be due to the elevation of the top of the standpipe. You could not exceed that; because if you did you would run the standpipe over.

(By the MASTER:)

Q. I understand you to say that if the standpipe on Rose Hill is full of water, the system would get the benefit of the pressure
722 from that standpipe; and the pumps do not add anything to the efficiency of the pressure, if they are in operation?

A. Adds to the efficiency in this way: relieves the system of the friction of the mains from the standpipe down to that point. That overcomes the friction on that line.

Q. The object of the pump is to do away with that friction loss?

A. Yes, sir; and maintain the pressure due to the entire standpipe at that point, not way off where it is now, but at that point. So in calculating friction due to the system at any point down town, we would only estimate it from that intersection, so long as the pumps were at work, instead of from the standpipe.

(By Mr. MARTIN:)

Q. In your suggestion for improving the system, I don't believe you suggested any mains running across from Broad or Front Street on 7th Street?

A. On Seventh? No, I didn't think that was necessary on Seventh, because it would be re-enforced on Eighth with large pipes and that would leave only 1200 feet of 4 and 6 inch pipes, each one having a hydrant on it—only one hydrant on it. If there were more than one hydrant, I would put in another line out there; but it is not necessary with only one hydrant because the location of these cross mains is such that the friction is very slight.

Q. Eleventh Street the same, you didn't suggest anything for Eleventh Street?

723 A. Eleventh Street is the same. You see there is an eight inch pipe and a ten inch pipe on one side and a six inch pipe on the other and only one hydrant on these cross lines, six and eight inch pipes.

Q. Do they need hydrants there?

A. Yes, sir; hydrants ought to be there.

There was a question asked me in regard to hydrants which led to the assertion on my part that hydrants should not be further apart than 400 or 500 feet. The hydrants as located now, many of them are much further apart than that. You also asked me in regard to that matter, if I had contemplated any increase. I replied that with the contemplated changes or suggested changes, a double number of

hydrants could be supplied; but the cost of putting in these additional hydrants was not calculated, because they have not been ordered.

Redirect examination.

(By Mr. WIMBERLY:)

Q. Where the hydrants are put further apart, what effect has that on the pressure at the nozzle?

A. Well, sir, as a general proposition, the further the hydrants are apart, the more hose is needed at every fire and the greater the friction and loss of pressure at the nozzle.

Q. You spoke of friction going through a considerable length of four inch pipe supplied only from one end, how does that same law apply to water going through a 2½ inch hydrant, supplied only at one end?

A. Two and one half inch hose?

Q. Yes?

724 A. The same principle holds.

Q. Is the friction greater or less through 2½ inch hose, the same neumber of feet, than through a four inch pipe?

A. We calculate friction through one hundred feet of 2½ inch hose about as much as through 1000 feet of four inch pipe.

Q. You speak of in four inch pipe cutting off a large part of the friction loss by letting the water come in from both ends as compared to a dead end: Is the friction loss in 2½ inch fire hose in the nature of a dead end or in the nature of a pipe having a supply from both ends?

A. In the nature of a dead end on a single line of hose.

Q. Is in the nature of a dead end?

A. Yes.

Q. You put on a Siamese coupling to prevent it from being a dead end up to the point of coupling?

A. Up to the point of the Siamese it has the same effect upon a stream of water through hose as it would on a four inch pipe, at each end. The friction on a single line of hose is eight times what it would be on a double line for the same quantity of water.

Q. That is to say, as I understand the law, if it is coming in from both ends, it only has to come at half as much velocity?

A. Yes, sir.

Q. And every time you double the velocity you have to cube the additional loss?

A. Yes.

725 Q. If you increase the velocity three fold, your loss would be 27?

A. Yes, sir.

Q. The answers that you gave as to the pressure of 38 pounds due to 107 feet elevation, that is based upon its being a gravity system, is it?

A. Yes, sir.

Q. And not a direct pumping system?

A. Yes.

Q. When the system was changed to a direct pumping system from a gravity system, at the time they built the Rose Hill standpipe, what effect did that change have upon the pressure?

A. Why, it increased the pressure, because it eliminated the friction in the main between the reservoirs and the town.

Q. Do you know how the height of the Rose Hill stand pipe compares with the height of the reservoir or the lower stand pipe?

A. I did have the exact measurements.

Q. Take it to be 120 feet higher?

A. I think it is.

Q. Than the down town standpipe, how would that affect it?

A. About 80 or 85 feet, as I recollect.

Q. How much higher is the top of the Rose Hill standpipe than the top of the stand pipe down town, eight- five feet difference?

A. I think the difference is 85.56.

726 Q. That would be the difference?

A. The difference between the bases.

Q. Between the height of one and the height of the other?

A. Between the base of one and the base of the other. If the stand pipes were of the same height, then the tops would be of the same distance of course. If, however, the lower standpipe is 130 feet and the upper one 120——

Q. (Interrupting.) As I recollect it, without confusing the record, really the difference is about 90 feet in the two standpipes. Now Mr. Boardman, when you change to the Rose Hill pressure by turning on the pressure from the upper part of the city, which as I understand is done automatically by the closing of a valve which leads into the lower standpipe for the time being, so as to give you the entire upper city pressure, what effect has that upon the pressure that you have in the lower part of the city?

A. Increases the pressure throughout the lower part of the city to the extent of the water running in the upper tower above what it is in the lower tower.

Q. You explained the pressure, as I understand it, of direct pumping as compared to the Rose Hill pressure, by saying that it makes a difference by cutting off the friction loss between the point where the standpipe is and the point opposite the pumping station, is that right?

A. Where they intersect. The point of intersection.

Q. Where the pipe leads off from the intersection into the lower part of the city?

A. Yes, sir.

Q. If it be a fact that the pumps are of such power that they
727 throw the water into the system faster than the small two six inch pipe leading into the Rose Hill stand pipe can relieve it, what effect has that, in the way of direct pressure, on the rest of the system?

A. Increases the pressure throughout the entire system to that extent.

Q. Suppose for the time being we cut off the Rose Hill standpipe entirely and take the pressure directly from the pumps, what sort of pressure would you then have?

A. You could get up any pressure then that the mains would stand or that the pumps would deliver.

Q. It would be a question of how much the mains would stand and the power of the pumps?

A. Yes, sir.

Q. Do you know how much these mains are tested to stand?

A. Pipe are tested at the factory to stand three hundred pounds pressure.

Q. Before the noon recess you were asked to calculate what the pressure would be at 9th Street for two fire streams under the present system, using, I take it, the Rose Hill pressure: Have you had time to make that calculation?

A. Yes, I made that calculation at the Noon recess. Of course it would vary at different points. At 9th and Broad Street the friction would be 10 99/100 pounds—call it eleven pounds, leaving a pressure at that point of 78 pounds. This is of course with the understanding that there are 600 gallons of water being called for at that point.

Q. With two streams how much is called for—two good streams?

A. Well, as soon as we vary the quantity of water used it
728 varies the height that you want to attain. Say 600 gallons per minute.

Q. You take that as your estimate?

The MASTER: That is the basis of your calculation?

A. Yes, sir. At 9th Street and Second Avenue the friction being 15 19/100 pounds, the pressure at that hydrant would be 74 pounds. At Ninth Street and Third Avenue, under the present conditions—that's the worse point that I have found, the pressure would be only 34 pounds. Ninth Street and Fourth Avenue the pressure would be 73 pounds. The discrepancy at Ninth and Third Avenue is due to the fact that there are four plugs on a four inch pipe. At that point it is a middle hydrant and is not re-enforced for 2000 feet. At that point it would only give 34 pounds.

The MASTER: What is that Fourth Avenue pipe, a six?

A. Fourth Avenue comes off of a six inch pipe.

The MASTER: Broad Street is 8 and 12?

A. Broad Street is 10 part of the way and eight part of the way; and that gives 78 pounds.

Q. You say that at Ninth Street and Third Avenue is about the worse part of the system?

A. I think it is about the worse part of the present system.

Q. I believe that is the Avenue you proposed laying the 16 inch main on?

A. Yes, sir.

Q. Which of course would make it the center?

A. Yes, sir.

729 Q. You were asked now as to the old system as it originally stood when you used gravity pressure as to the effect of six streams on the initial pressure of 38 feet?

A. Thirty eight pounds.

Q. I understood you to say that if you were to use six streams for

something over three hours, the pressure would be reduced at the end of that time to 20 pounds, that was taking the gravity pressure without the Rose Hill pressure?

A. Alone, yes, from the reservoirs.

Q. In order to use six streams——

A. (Interrupting.) I also calculated the height at 107 feet and not at 120.

Q. I was taking it — what the contract called for rather than the actual height of the *reservoirs*, being a little higher. Now Mr. Boardman in these three hours that you use the six streams, would that give time to get up the engine pressure to supplement the pressure from gravity?

A. Yes. Less time than that you can get up steam on an engine and boiler.

Q. Gravity system is intended to last how long—I mean how is it to be re-enforced—expected to be re-enforced.

A. Well, a system such as this was, was evidently built or expected to have steam engine—steam fire engine pressure. The pressure originally was never sufficient for fire protection directly from the hydrants.

Q. During the three hours that the water would drop to 20 pounds, you would have time to steam up your engines and get your pressure from them?

730 A. Well, the city should be provided with fire engines that would be ready for service in much less time than that. The whole town would be burnt down.

Q. How long does it take to steam up a fire engine where they are properly equipped?

A. The present practice is to have steam on the engine all the time. The water is already hot or at low pressure at all times and it takes only a few minutes to get the pressure up while they are going from the station to the fire, which is usually ample time in which to get steam up on an engine.

Q. With the steamers to supplement the pressure, as the present system now stands, would you say the water is sufficient to supply the steam engines?

A. As the system is at present?

Q. Yes?

A. Yes.

Q. Going to the questions of germs: You said that typhoid fever germs would stay in certain waters and they are liable to multiply, do these disease germs multiply in all waters?

A. Disease germs, germs that are usually classed as noxious germs, are those which feed upon organisms and do not feed upon minerals as plants do. They have to have organic matter in the water to feed them, either vegetable or animal organisms.

Q. What is the effect of filtering upon the water as to the multiplying of germs in it, after it is filtered?

731 A. Filtering the water takes out the organic matter to such an extent that the germs will not multiply for the lack of food, in properly filtered water, near as rapidly as they would in water in running streams or an impounding reservoir.

Q. Mr. Wimbish asked you about systems in certain cities and their source of water supply and I believe among them was New York: What source of supply has New York?

A. Croton River.

Q. Does it get its water from a river?

A. O, yes, Croton River.

Q. You spoke of getting it some distance: Is there any river close by that it can get its water from?

A. Only Croton River. The Hudson River is salt water—brackish.

Q. You spoke of Mobile, no fresh water river at Mobile, how does Mobile gets its water?

A. The river at certain times is fresh and at other times is brackish; and Mobile has to get its water from smaller streams not affected by the tide and brackish water coming up from the Bay.

Q. Do you know what streams she actually gets her water from?

A. Two creeks—pretty good sized creeks. One is 9,000,000 gallons per day and the other 27,000,000.

Q. Those are good big creeks?

A. The larger one the Danville Water Supply is taken from and the other is a rather small creek, which was inadequate to supply Mobile.

Q. Had to go to larger streams?

A. Yes.

Q. You spoke also of Newark, what streams does Newark get its water from?

732 A. Gets its water from the head waters of the Raritan River.

Q. I believe those are the only ones you mentioned: The Raritan is a River?

A. Raritan River; but the water is taken from the head waters. Various streams form the Raritan River and they have a succession of reservoirs and the water is taken from them.

Q. You spoke of the practicability of these larger cities getting their water as much as 30 miles, do you know how the wealth of those cities and the ability to stand such an expense, compares with——

Objected to—

Q. How does the expense of getting water any such distance compare with the ability of cities like Columbus?

A. Well, nobody would attempt to get water from such a distance when they could get it at their door as they can in Columbus. The expense and interest on the investment and sinking fund would amount to more than the cost of filtering and pumping.

Q. In figuring on getting water from a considerable distance, is the expense in proportion to the increase in distance?

A. The expense is greater.

Q. Why is that?

A. Unless you have an excessive elevation; because you have to increase the size of your pipes to get the same quantity of water.

Q. The further the distance you have to bring it the bigger pipe it takes?

733 A. Yes.

Q. You spoke of the capacity of the 12 inch pipe from the reservoir to the pumping station, the number of gallons per day was only a million and 250,000 gallons, is that based upon gravity or gravity re-enforced by pumping?

A. By gravity. That's what a gravity supply would deliver here.

Q. Unaided by the pumps?

A. Yes. If you attach the pumps, the suction of the pumps would be equivalent to adding that much to the head of water at the other end.

Q. Mr. Boardman, you were asked this morning something about Stewart Spring and its effect, under ordinary conditions, towards increasing the flow into the reservoir—in each reservoir: Do you remember what was the condition of Stewart Spring, as a source of supply, when you were down here in 1902?

A. Yes, I looked at it at that time.

Q. How was it?

A. Well, I don't think there was a 100,000 gallons per day going through it.

Q. Not 100,000 a day?

A. No, not 100,000 gallons a day.

Q. Do you know whether before you came Stewart Spring had been dry or not?

A. No.

Q. I will ask you whether, at the time you were here, this Holland stream, even if it had been re-enforced by Stewart Spring, would have been sufficient to have supplied the city?

A. No.

734 Q. I will ask you whether the stream going into the reservoir, re-enforced by the Stewart Spring, would have been sufficient to have kept the water alive and pure and supplied the city at that time?

A. It may have done so if it could have been carried into the upper reservoir. It may have kept that in condition so that they could have gotten a good many more days' supply from it; but even with that supply it would not have lasted through the drought.

(By the MASTER:)

Q. Would you say from your knowledge and observation of the reservoirs over there, that the upper reservoir had been properly constructed as a storage reservoir?

A. I think to the extent it was constructed it was properly constructed, merely for a storage reservoir—yes—impounding reservoir. Since it was constructed there has been a large amount of silt and sand come down the streams and gotten into it and a portion of it has been filled in, so that at this time there is more danger of grass and weeds growing there than it was when it was constructed.

Q. You mean to say in your opinion it was properly constructed: Would you say that it had been properly maintained as a storage reservoir?

A. I think it should have been cleaned out in the upper reaches there to some extent and the vegetation kept out of it.

735 (By Mr. WIMBERLY:)

Q. At the time you were here in 1902, was there any cleaning out of that reservoir done?

A. Yes, they were cleaning out the vegetation all up through that stretch I referred to and were preparing to scrape the silt from the bottom of the main reservoir where it was deeper—where there was no grass.

Q. There is another question that has been suggested to me: You spoke of the purpose of the upper reservoir being that of a settling basin: How would the effect of the upper reservoir, as a settling basin, upon the purity of the water, compare with the effect of the filter system that was contamplated by Article eleven of the original contract?

Mr. WIMBISH: Do you call it a settling basin or an impounding reservoir?

WITNESS: I think he said it was a settling basin and I said impounding reservoir: I think I said the mud and silt would settle in it and the clear water taken from the top.

Q. Do you remember the last question I asked you about the effect of that upper reservoir for settling purposes as compared with the efficiency of the kind of filter mentioned in Article eleven of the original contract?

A. I had rather have that than 3 or 4 such filters described there.

Q. I believe you stated that filtering could have been done in '91: I will ask you whether or not in '91 the matter of filtration received the attention that it does at the present time?

736 A. No. Very few cities were provided with filters at that time.

Q. When did the importance of filtration in this part of the country first come to be generally recognized?

A. Well, it has been growing since the introduction of filters upon northern and western river streams. It has been forced upon us by our being obliged to go to the larger streams.

Q. To the rivers?

A. To the rivers and larger streams for our water supply in the various cities in the south. Prior to that time there were only a few cities that had to take their water from the rivers. At that time Atlanta was getting her's from a small stream, while Augusta and Savannah were taking their's from the river, using settling basins to get the mud from the water; but as they grew the efficacy of such filtration became more and more difficult, requiring much larger reservoirs to impound it in; and after a longer period of time it met with this same difficulty, that of impounding water, as in a hot climate it required larger reservoirs and took a longer time for the water to settle; and it was not until the cities grew and were forced to take or get their water from the larger streams and the trouble with the red mud, such as our streams in the south have, that the question of filtration became a burning one.

Q. Who really was the pioneer in that line of work in the South?
A. I think I was the first to make a success of filtering the waters. The Hyatt Filter Company and the Jewel Filter Company
737 were the pioneers in the building of filters.
Q. How long before the advantages and the necessity of such a system came to be generally recognised in the South?
A. I think the desirability of it was recognised long before——
Q. (Interrupting.) I mean the efficacy and success of it?
A. About '93 or '94, along there.
Q. After it was recognised by the few pioneers, how long was it before it was generally adopted by the Southern cities?
A. Well, a number of cities have not yet put them in that should.
Q. In the south it has not been in general use for more than 5 or 6 years?
A. No.

Recross-examination.

(By Mr. MARTIN:)

Q. Do I understand you to say or mean that if the upper reservoir had been built according to contract it would not have been any improvement over the way it was built?
A. I didn't say that. I said I thought it was properly built for the purposes intended. It would have been better in this respect: it would have taken longer to fill up. It would have taken longer to fill up in that upper part. Would have been deeper there of course.
Q. Marginal depths would have been better?
A. Would have remained better longer.
Q. If the vegetable matter had been removed and kept or maintained that way, wouldn't that have been a big improvement
738 on what you saw there?
A. Yes.
Q. Under the gravity system not re-enforced—not re-enforcing it by the Rose Hill standpipe and the pumps, what would have been the pressure at Ninth Street and Third Avenue, the place where you said it was 34 pounds not with the Rose Hill standpipe—not re-enforced by the Rose Hill standpipe nor by the pumping system inaugurated by the Receiver?
A. Of course I could make a calculation and find out about what it would be. I think for 600 gallons of water from that plug, that in order to get it, you would have to add or attach your steam engine.
Q. In other words: there would have been no pressure?
A. I don't think it would have flowed unassisted by the steam engine, 600 gallons per minute at that point.

(By Mr. WIMBERLY:)

Q. Do you know when the pumping system was first inaugurated?
A. I think the pumping system was inaugurated when the Rose Hill standpipe was built.
Q. You were down here in 1902 before the Receivership?
A. Yes, sir.

Q. Was it a pumping system at that time?
A. Yes.
Q. You spoke of 600 gallons per minute at that particular point would have been more than it would flow, you think, under the original gravity system?
A. Under the natural——

739 Q. (Interrupting.) A. Six hundred gallons is more than one stream?
A. Yes.
Q. You don't mean that it would not flow one stream?
A. It is more than two streams—ordinary fire streams.

(By Mr. WIMBISH:)

Q. What would have been the pressure for one stream?
A. The pressure of one stream might have been up to 25 pounds.
Q. Two streams?
A. Two streams, probably it would have dropped down to 20 or 22.
Q. By two streams you mean about 300 or 400 gallons?
A. By two streams about 320 gallons.

(By Mr. WIMBERLY:)

Q. I believe you say that is about the weakest part of the system?
A. I think that is about the weakest part of the system.

740 A. E. BOARDMAN, re-called by the Complainants in rebuttal, testified as follows:

(By Mr. WIMBERLY:)

Q. What is the effect of the height of the pressure gauge above the floor or level of the street or ground as to the pressure it registers?
A. The actual pressure upon the mains——

Objected to as not being in rebuttal.
Objection overruled.

WITNESS: The pressure upon the mains is greater than that indicated by the gauge by one pound for each 2¼ feet that the gauge is above the main. In other words: if the gauge is 2¼ feet higher than the main, and it registers 31 pounds pressure, the pressure on the main is 32 pounds. If it is 4½ feet, as is indicated by the answer to the question, there should be two pounds added to the gauge register to give the true pressure upon the main. If it is greater, in like proportion.

Q. In other words: you mean to say, if I understand you correctly, that these figures already testified to by Mr. Preer in explanation of the statement in reading the record of the gauge, there must be an allowance of a pound additional, as shown by the record, for every 2¼ feet of height?
A. Yes, sir; that the gauge is above the main.
Q. If you put the gauge up as high as the standpipe there would be——
A. (Interrupting.) Would be no pressure.

741 Q. You heard the reading of the testimony of Mr. Pierson?
A. Yes, sir.

Q. Mr. Pierson said something about the effect of muddy water running through the pipes for a considerable time and foul water that would for many months afterwards coming through the pipe: I wish you would give your own views as to matters of that sort?

A. My experience is that by flushing the mains through the hydrants, that mud and all objectionable matter in the pipes, left by polluted water, can be removed in a few days. May be some discoloration for several weeks. When the pipe is opened and the water allowed to rush in at great rapidity, for all practical purposes it can be eliminated in a week or so by frequent flushing.

Q. The mud that accumulates, how is it brought in?

A. Brought in by the water flowing into it; and it is held in suspension; and when the velocity of the water lessens by stopping up the faucet through which it flows, it naturally settles in the pipe. When the current is again started, that water stirs up the sediment and releases and brings forward the mud. I think that was very evident at the time we were pumping muddy water into the mains: when the faucet was stopped for any length of time and then reopened, the water for a few minutes was very much more muddier than it was if left to flow. The same is shown in opening a hydrant after it has stood for some length of time: the sediment comes
742 out from the hydrant as soon as the current is re-established; and for a few minutes considerable mud and iron rust, that has accumulated in the pipe, will be discharged from the hydrant; and then the water comes clear. Only takes a few seconds generally.

Q. If it be true that after the filtering system was built, that all the dead ends were thoroughly flushed, and after that time to the present, water coming out of these different faucets is clear, what would you say as to the condition of the pipes now as to mud?

A. I would say that they were practically clean.

Q. I will ask you what effect, if any, mud has upon corrosion—bringing about or causing corrosion of the pipes?

A. It would have no effect upon the pipes if it contained no acids.

Q. Anything in the composition of mud that corrodes the pipes?

A. Not anything in clay, sand or earth, unless, as I say, it is impregnated with some acid.

Q. Do you know the character of mud they have in these soils here around Columbus?

A. Yes.

Q. Did you see the mud in the reservoirs in September, 1902: I will ask you whether the character of mud they have down here, whether there is anything in it that would cause corrosion of the pipes?

A. I don't think that there is anything in this soil that would cause corrosion in the pipes more than natural water would.

743 Q. Have you ever seen any of the pipes in Columbus?
A. I have seen some. Exposed some—cut them.

Q. What was the condition of those pipes?

A. The condition in all cases I saw, the pipe was very good—very clean.

Q. One of the witnesses said something, I think about some of the pipes being unequal in cast: Will you explain how pipes are tested?

A. The pipes are tested at the factory for equal thickness of material and for strength and for any fa-lt or crack that might be in the pipe. It is tested for equal thickness all around by being rolled upon a perfectly level track, the track supporting the pipe at either end. If the pipe has more metal on one side of the diameter than on the other, in this rolling the pipe will come to a rest with the greatest thickness down and when started up again it will return—takes an effort to make it turn over. If it rolls without any retardation at some point, it shows that the cast is equal all around. Should it indicate more iron on one side than on the other, it is thrown out.

Q. Rejected?

A. Rejected. That same test also proves whether the pipe is perfectly straight. Necessarily if there was a bend in the pipe it would settle, showing that bent part would be on the inside of the pipe. If that occurs it is also rejected. Then it is taken up and put in a hydraulic press and filled with water. The hydraulic press pumps the water up until the gauge shows 300 pounds to the square
744 inch of pressure; and if it does not break at that, the hammer is used to see whether it has developed any crack in the test; and if there is a clear ring to the pipe, there is no crack. The slightest crack is indicated by the sound from the hammer. While a hole or a crack might not be detected in an inspection, yet the sound will indicate it immediately. If there is any such crack the pipe is rejected. Pipes are again tested in laying. The danger being that some crack or break has developed in the pipe during transportation or handling. When the pipe is ready to be lowered into the ditch, it is suspended by a crane and struck again with the hammer to see if there is any undetected flaw. If there is, it is taken out and rejected on the trench. These tests generally detect any weakness or imperfections in the pipe.

Q. Mr. Boardman, you have had, you say, a very large practical experience in laying pipes: As to the durability of cast iron pipe, as you have stated, do you speak of that as a general rule or is it a variable quantity, so that some pipe is durable and others rust right out?

A. We consider it a general quantity.

Q. Is that your experience?

A. We so treat it. It is only our estimates and we consider it quite general in our estimates and so treat it.

Q. Your experience is that that is the general rule?

A. Yes, the general rule.

745 Q. With pipe as you come to it?

A. Take it by and large, as the saying is, we find it very durable.

Q. From your practical experience with waterworks, and your knowledge of the life of cast iron pipes, and the especial investigation you have made down here in Columbus, what would you say as to the value of cast iron pipe that compose this system now as compared with what they would be if new?

A. There is a very slight deterioration. We would probably allow, in estimating their value, a slight reduction from their original value; but it would be based upon the probable life of over fifty years.

Q. For practical purposes how does it compare with a new system?

A. For practical purposes about as good as they would be new.

Q. Mr. Pierson testified to something about this system not being built with a view to extensions: Will you state as to this present system, how far it admits of extensions?

The MASTER: Didn't he go over all that?

Mr. WIMBERLY: No, sir; not fully.

WITNESS: I think this system, like most others, can be extended by judicial additions of larger mains for feeding various sections. I think it is an engineer's duty to advise the retention and saving of all parts of the water works system already in operation; and I do so when the extension or enlargement of a system is put before me for advice as to its treatment.

746 Q. What would be the value of these pipes in there now as being made an integral part of such extended system?

A. They would be about as valuable as if they were perfectly new. In laying out a system of water works for Columbus, as it exists today, an engineer would probably change the sizes of the pipes on several of the streets and I myself say that an engineer would much prefer to make a new system at any place than to try to adopt or to strengthen an old one. It is much more simple and much more pleasant; but there is no difficulty in strengthening pipes already in the ground by judicial addition of larger pipes to act as feeders; and by strengthening those pipes by tying them in and increasing the circulation by having larger quantities of water to reach those same pipes. I think to say that this system is not valuable is rather ill-considered. There are points at which an engineer would prefer to take up the pipes and put down larger ones; but it is not necessary. The same result can be obtained by placing larger pipes along the streets which have no pipe- now or very small ones. And it is to that end to save as much as possible the value of this plant that my suggestions for the laying of larger mains and the tying in of those already in the ground have been made. I think I have made it clear to your Honor, that in order to get the pressure in a certain street having a main, it is not necessary to take that main up

747 and *and* put a larger one down, if the water can be brought into the smaller main at frequent intervals, so that the friction head of that main, with a larger quantity will not exceed that which will occur if the pipe had been larger in the beginning. And it is to that end that this frequent grid-ironing with larger pipe has been re*s*rted to in my recommendation. The result is the same, the cost of attaining the result would be less and the saving to the whole system would be greater by this system of strengthening.

Q. In the grid-ironing of the present system with larger pipe, how does that compare in area of distribution right at hand—right

near the doors, with what would have been the case if you had laid a similar number of larger pipe at the beginning?

A. I think I stated that the result to be attained by this grid-ironing was to give the same quantity of water along these streets, with no greater friction loss than if larger pipe had been there originally laid.

Q. In addition to giving as much pressure, I will ask you whether or not it is true, having both these larger grid-irons and these smaller pipes too, does not give a more perfect distribution, that is, distribution to a larger area, than would be possible if you only used originally the same quantity of larger pipe?

A. You could reach the customers much more readily and with less small pipe from the mains to their residences. The larger cast iron pipe being very much mode du-able the repair account would be much less in the long run.

748 Q. In other words: the small pipe you have now could be used for that purpose and would require less service pipes?

A. Yes.

Q. What part of a system requires the most re-placing, the street mains or the service pipe?

A. You mean what part——

Q. Is the most durable?

A. What part of the system requires the most frequent re-placing?

Q. Yes?

A. The service pipe, being wrought iron, require more frequent repairs and re-placing.

Q. More liable to rust?

A. Yes, sir.

Q. Less durable?

A. Yes.

Q. So I understand you to say by a judicial system of re-enforcing the value of every portion of this present system, the pipes, can be preserved?

A. That's my opinion.

Q. Mr. Pierson, in one place in his testimony that you heard yesterday, gave it as his opinion, that clay will adhere to pipe to such an extent that it is impossible to remove it at all; and by reason of that fact the pipe would be useless: What's your experience in that matter?

A. My experience is that properly coated pipe, and you know pipe is coated inside and out, a tar coating, prevents the adhesion of clay.

749 It is only when the coating is destroyed that anything will adhere to the pipe; and then it has to combine with the oxide of iron to become an integral part attached to the pipe to prevent its easy removal by strong current water. In some small wrought iron pipe that is not protected, we find quite a coating adheres to the sides—service pipes; but we have very little trouble with cast iron pipes of larger diameter.

Q. There is a difference as to the kind of iron you use in service pipe, as to its becoming rusty and coated and the cast iron pipe you use in the mains?

A. Yes, a great difference.

Cross-examination.

(By Mr. MARTIN:)

Q. Speaking about this coating that is used on these pipes inside and out, what is that composed of?

A. Composed of tar and bitumen—a kind of asphaltum.

Q. That is the kind you use now?

A. Yes, sir.

Q. Do you know whether that is the kind used in these pipes?

A. The same kind has been in use for something over fifty years.

Q. Do you know that same kind was actually used in these pipes?

A. Yes, sir.

Q. On the inside?

A. On the inside. The pipe is dipped while it is hot into the bath.

750 Q. How long will that coating last?

A. I have been using it for thirty years. Pipe that I put down 30 years ago still have it intact.

Q. Is that coating on the inside?

A. Inside and out.

Q. What is your judgment as to the durability of the coating? It does wear out?

A. I have not seen it wear out very much. It sometimes gets pitted. If it is broken in any place or an electrical current destroys the iron under it, it will pit and corrode to some extent.

Q. Any of that coating in there?

A. Yes; there is coating in there (Referring to exhibi- introduced in evidence by complainant from 6 inch pipe at Racine Hotel).

Q. It is not uniform, is it?

A. No.

Q. And it has broken places in it?

A. Yes, it is broken in some places; but there is considerable on there still. It is thicker in some places than others. It has been broken by cutting on the edge here. It is fairly well coated now. That rough portion is not the coating, it is the black part under it.

Q. Where it does wear off there is danger then of corrosion by mud of the iron?

A. May be to a slight extent; but as soon as a coating of iron rust is formed upon the pipe on the inside, there is very little corrosion. The iron rust is not soluble to any great extent and forms a protective covering. The great trouble with the iron in pipes

751 now-a-days, is electrolysis, which carries the iron away. Very little trouble with corrosion of cast iron pipe in the ground by water passing through.

Q. Then why do you use the coating at all if it is not of any value?

A. It protects the pipe and makes the pipe smoother and protects it from this little rust that accumulates which would make a rough surface to which would be attached mud and silt that might come in. It would become very firmly attached to the iron without the coating.

Q. You spoke of mud that gets into the pipes, unless there is an acid in it, you say there is no tendency to corrode?

A. No more than would be from the water itself.

Q. Is there acid that comes into these waters from the reservoir?

A. I don't think there is any acid in the soil here.

Q. What produces that gas you spoke about yesterday—the odor?

A. Decomposition of organic matter.

Q. Wouldn't that——

A. (Interrupting.) That is not an acid.

Q. No acid at all about that?

A. I don't think there is any acid about it, no.

Q. You don't know that there is not?

A. No. The odor that you probably would notice would be sulfureted hydrogen, which is *not* an acid gas but it is very pungent.

Q. Did I understand you to say awhile ago that the life
752 of these pipes was estimated at 50 years?

A. In making an allowance for duration of pipe, we never put the life of a cast iron pipe less than 50 years.

Q. Why do you say 50 years?

A. Because we are positive about the life of the pipe being over 50 years.

Q. You think then that a pipe that is 23 years old is just as good as one that is six months old?

A. Well, we do as far as its strength goes.

Q. If after 23 years it is just as good, why wouldn't it be just as good a thousand years?

A. As I said, we usually allow a little for deterioration.

Q. How much do you allow?

A. Probably for that length of time allow about 5 per cent. for deterioration.

Q. For how many years?

A. 20 years.

Q. That would make the age how much?

A. The age of pipe is usually calculated from 50 to 100 years; but in the first ten years we do not consider that the deterioration is near so rapid as the last ten. A pipe would have to be over 25 years old before we would begin to consider the deterioration very rapid.

Q. After 20 or 25 years you would consider the deterioration very rapid?

A. Would be more rapid than the first ten; and then after it had been in the ground 40 years we would consider that it would
753 deteriorate more rapidly than it would the first 20.

Q. Why do you consider after it had stood 20 years that it is not less valuable than it was at first?

A. I say it is about as good in its place as if it were new, for practical purposes.

Q. You mean you would not take it up and re-place it with other pipe?

A. No; not merely because I didn't think it was good. Wouldn't take it up unless I wanted to put down larger pipe.

Q. Who showed you the pipe that had been cut here in this system?

A. Why, I had it cut myself.

Q. Where?

A. Down near the water works where we were building—where we were building the new station. Had it cut in several places.

Q. That pipe was new?

A. I don't know how long it had been down.

Q. Well, you cut it near the pumping station?

A. Yes, all through that section. Had to cut a great many places there of that size pipe.

Q. That was put there when they established the pumping station?

A. No, not on the pumping station, on the mains. It was on the distributing mains, 6 and 8 inch mains up there.

Q. 17th Street?

A. Yes, sir.

754 Q. Now you say that these four inch mains could be used in strengthening the system by the mode you laid out yesterday, and putting in these larger pipe and this 16 inch main down Third Avenue and then the other across?

A. I think all the pipe in the system could be utilized.

Q. You don't mean to say without that strengthening it is a proper pipe, do you?

A. I don't think it is a proper size as the system is laid out now—for the work to be done now and in the future. Could be strengthened in a great number of places.

Q. You don't consider it has been the proper size for the last 10 or 15 years?

A. It should have been strengthened, probably, several years ago.

Q. Don't you think it ought to have been done?

A. If I had had it in charge I would have recommended it.

Q. Would you have put them down at all as an original proposition, the way they have been put down here?

A. I could not answer that because I don't know what the condition of the streets was, or the number and size of houses on them at that time.

Q. Would you have put them up and down Third Avenue?

A. As it is now?

Q. Yes?

A. No.

Mr. WIMBERLY: That is not in rebuttal of anything I asked.

755 WITNESS: If your Honor will allow me, I will say, I don't know of any system that did not need considerable strengthening and extension ten years after it is built.

Q. This being built in '82, it needed strengthening in 1892?

A. Very likely.

(By Mr. WIMBERLY:)

Q. You say that you cut pipes: where was it you cut those pipes?
A. Up, I think it is on First Avenue and 17th Street, along there.
Q. Do you remember what streets—some of the streets?
A. First Avenue and 17th Street. I think that's where it was—most of it.
Q. I will ask you to look at this map——

The MASTER: He stated that he cut the pipes in the neighborhood of 17th Street, on the mains?
WITNESS: On the distributing system.
The MASTER: I think I understand where he says he cut the pipes.
(Witness identified on map in report of Mr. B. M. Hall, introduced in evidence by respondents, and attached as exhibit —, to volume 1 of this record, page 24, in blue pencil mark, the place where he cut the pipes, on plate III; and on page opposite page 32, plate IV in red pencil mark).

Q. In speaking of the life of cast iron pipe, you mean to say it as good, practically, as new for as much as 50
756 years?
A. Not as good as new but still serviceable.
Q. Still serviceable pipe at the end of fifty years?
A. Yes, sir.
Q. You fix that as the limit?
A. We have not had time enough to thoroughly determine at what point well coated pipe should be considered unserviceable.
Q. It has been tried as much as fifty years?
A. We know that, yes.
Q. Without any practical deterioration?
A. Still in use and considered valuable for use.
Q. Judge Martin showed you a sample here cut from one of the older pipes: what would you say as to the condition of that pipe?
A. Very good condition. Shows a very excellent quality of iron and very uniform in thickness, etc.
Q. Can you by looking at it tell whether any of the coating has been removed with a knife, or anything, by hand?
A. It is quite evident here that some scraping has been done on it.
Q. I will ask you whether the coating is still there?
A. The coating is still there. Quite a good coating yet.
The MASTER: You say the coating is good for practical purposes?
A. Yes, sir.
The MASTER: Allowing for the scratches of the knife there?
757 A. Yes, sir; very good coating.

(By Mr. MARTIN:)

Q. It is broken where there has been no scratches?
A. I don't think it is broken except where there is scratching and broken from the cutting. The part there that you think is broken coating has not been broken. Little blisters in the coating left when it was cooled, etc. has made the coating rough in places; but in other

places the coating is still smooth. One not familiar with it it would look as if there was no coating there.

Q. What size pipe did you cut at 17th Street?

A. A six inch pipe was cut there.

(By Mr. WIMBERLY:)

Q. Was it all the same, practically, as far as wear and tear was concerned?

A. We could not see much difference. I paid particular attention to the six inch pipe, because we had to depend upon that to carry water to the standpipe after leaving First Avenue, from the new station.

(By Mr. MARTIN:)

Q. That was the Rose Hill standpipe?

A. Yes. All this six inch pipe is joined together with the pipe running up to Rose Hill standpipe. The pipe that was cut was a six inch main laying upon First Avenue and connected it with pipes at 2 or 3 different points—2 or 3 different streets with pipes running up to the Rose Hill standpipe.

(Court here took a recess for dinner.)

758 *Deposition Geo. H. Pierson.*

Offered by Respondents.

In the Circuit Court of the United States for the Northern District of Georgia, Western Division.

In Equity. No. 59.

MERCANTILE TRUST AND DEPOSIT COMPANY OF BALTIMORE, Trustee,
vs.
CITY OF COLUMBUS ET AL.

Bill of Complaint.

To Joseph Packard, Hall & Wimberly and Louis F. Garrard, Solicitors for complainant:

Please take notice that the depositions *de bene esse* of George H. Pierson and Mr. Coffin and Mr. Staunton of the late firm of Coffin & Stanton of New York City each of whom reside more than one hundred miles from the City of Columbus, Georgia, where the hearing in the above entitled cause is to be had before the Master on the 4th day of February, 1904, will be taken for the purpose of being read in evidence at the hearing of said cause, on the part of *teh* defendant, the City of Columbus, before Wm. Becket Harding, Notary Public, at the office of the Atlantic & Western Construction Company, 10th floor, number 71 Broadway, New York, N. Y. on the

25th day of January, 1904, beginning at 11 o'clock in the forenoon of that day and continuing from day to day until completed.

You are requested to be present and cross-examine, if you desire to do so.

T. T. MILLER,
J. H. MARTIN,
ELLIS, WIMBISH & ELLIS,
Solicitors for Defendant, the City of Columbus.

This the 15th day of January, 1904.

759 Service accepted, this — day of January, 1904.
Mr. Miller Counsel for City of Columbus handed me Copies of the within this 15th day of January, 1904.

L. F. GARRARD,
For Compl'ts.

In the Circuit Court of the United States for the Northern District of Georgia, Western Division.

In Equity. No. —.

MERCANTILE TRUST & DEPOSIT COMPANY OF BALTIMORE,
vs.
CITY OF COLUMBUS ET AL.

Bill.

STATE OF NEW YORK,
City and County of New York, ss:

Pursuant To The Attached Notice to take testimony *de bene esse* in the above stated cause, there appeared before me, at the office of the Atlantic & Western Construction Company, 71 Broadway, New York City, at eleven o'clock in the forenoon of January 25th, 1904, Joseph Packard, Solicitor and of Counsel for Complainant; and T. T. Miller and W. A. Wimbish, Solicitors and of Counsel for the Defendant, the City of Columbus; and also appeared George H. Pierson, one of the witnesses named in the attached notice.

And it appearing that, on account of illness, the witness, George H. Pierson, had been unable to procure and bring with him desirable papers and memoranda, the taking of the testimony was, by
760 consent of counsel, adjourned until three o'clock in the afternoon.

At three o'clock in the afternoon of January 25th, 1904, the above named persons, counsel and witness appeared before me at the office of the Atlantic & Western Construction Company and the taking of the testimony was begun.

GEORGE H. PIERSON, a witness introduced in behalf of the defendants, being duly sworn, testified as follows:

Direct examination by Mr. MILLER:

Q. Where do you reside, Mr. Pierson?
A. I reside in New York.
Q. What is your business?
A. Civil Engineer.
Q. How long have you been a Civil Engineer?
A. Thirty-five years.
Q. What experience have you had as a Civil Engineer?
A. My experience has been a quite varied one, embracing through my career almost all branches of engineering work.
Q. Have you had any experience as a Hydraulic Engineer?
A. Yes, sir, I have confined myself almost exclusively to that line of the profession for something like twenty-five years.
Q. Have you had any experience in the development of water-works systems?
A. Yes, sir.
Q. What experience have you had?
A. Well, I have been—I have built waterworks in almost every State in the Union.
Q. How many have you constructed?
761 A. I can't remember the exact number—somewhere along about forty that I have actually built. I don't know how many I have designed. That is a matter of record. The manual of American Water-works published a few years ago gave the record of all the water-works constructed and the Engineers who designed and built them. My record will be found in that.
Q. You remember what the record is?
A. I couldn't state—You mean just the number?
Q. Your record?
A. I think it is somewhere about forty, sir.
Q. Are you connected at present in any way with any organization of Civil Engineers?
A. The American Waterworks Association.
Q. Society of Engineers?
A. Oh, yes, sir.
Q. You connect with them?
A. I am not a member, no, sir.
Q. Mr. Pierson were you ever, as an Engineer, called upon to investigate the system of water works in Columbus, Georgia, owned and operated by the Columbus Water works Company?
A. Yes, sir.
Q. What time was that?
A. That was in '90.
Q. 1890?
A. Yes, sir.
Q. You remember what time in '90?
A. October was it? I have forgotten just the date. It says in the affidavit, I don't remember that date.

Q. The affidavit says the latter part of the year 1890?

A. It was in the month of October. I remember that.

762 Q. In the month of October, 1890?

A. Yes, sir.

Q. At whose instance did you make this investigation?

A. Coffin & Stanton, Bankers, at that time of 72 Broadway.

Q. This City?

A. Yes, sir, this city.

Q. In what way were you connected with Coffin & Stanton?

A. I was in their employ as their Consulting Engineer.

Q. Were they identified and connected with any systems of waterworks in different parts of the country at that time?

A. Yes, sir, very many.

Q. You were their consulting Engineer?

A. Yes, sir.

Q. How came the firm of Coffin & Stanton to make any investigation with reference to the system of waterworks owned by the Columbus Waterworks Company in Columbus, Georgia?

A. Why, they directed me to go and make an examination, as they did in matters where they wished an examination made; for what purpose that investigation——

Q. You remember at whose instance they made the investigation?

A. Some papers were handed to me giving me certain data and I was told to go and make an examination.

Q. What was the character of the examination you were told to make?

A. To make a report on its physical and financial condition.

Q. Do you remember who approached the firm of Coffin & Stanton that brought about this investigation on your part?

A. I couldn't testify definitely to that particular question.

763 Q. Do you remember whether B. F. Archer or Thomas R. White were in any way connected with your investigation?

A. They were. Their names appeared in the papers as officers of the company.

Q. Do you know what the purpose of the investigation was?

A. To ascertain if that property would be a desirable one for Coffin & Stanton to purchase.

Q. Was it made with a view, upon the part of Coffin & Stanton, to purchase the system?

A. If the report had been satisfactory they would have.

Q. That was the object in view was it not?

A. Yes, sir.

Q. Well, just tell Mr. Pierson in your own way the result of your investigation of this system of water works in Columbus?

A. The papers that were given me included maps, statements and figures which I was supposed to verify, or otherwise. On reaching Columbus I looked over the properties of the company, examined into the detail of the physical part of the works and made all the examinations that I thought necessary to make my report. I didn't find the conditions as were represented in all cases.

Q. What was represented to the firm of Coffin & Stanton as to the

system of waterworks in Columbus; its cost, and the amount of mains, etc.?

A. The system was represented to have cost about $200,000. They claimed to have something like between sixteen and seventeen miles of mains. They claimed to have reservoirs having capacity of one hundred and twenty million gallons. They claimed a water-
764 shed of something over seven thousand acres.

Q. Do you remember the accurate number?

A. It is in my affidavit. I can't tell you exact number.

Mr. PACKARD: I object generally to all the testimony as to representations of other parties where the representations themselves are not produced.

Q. (Handing affidavit to witness.) Refresh your memory by looking at the affidavit as to the number of acres represented to have been owned by the Columbus Waterworks Company in connection with watershed reservoirs?

A. The watershed comprises seven thousand six hundred and eighty acres.

Q. Do you know, Mr. Pierson, who made those representations at the time to Coffin & Stanton?

A. They undoubtedly were made by Archer and White.

Q. Who were Archer and White?

A. Archer was President of the Columbus Water Works Company and White was the Secretary and Treasurer.

Q. How many feet of twelve inch pipe did they represent was included in the system?

A. Twenty thousand feet.

Q. Did they make any representation as to the annual receipts?

A. Yes, sir.

Q. What was that?

A. Twenty-one thousand dollars.

Q. Any representation as to operating expenses?

A. About fifty-five hundred dollars.

Q. I believe you stated a while ago that they furnished to the firm of Coffin & Stanton maps, and surveys of the system. Did they?

A. Yes, sir. I had a map of the city of Columbus upon
765 which was laid down the water mains, showing the sizes and lengths.

Q. Did they furnish a copy of the contract with the City of Columbus made by Thomas R. White?

A. Yes, sir, I have that.

Q. I believe you stated that you made a thorough examination into the system?

A. Yes, sir.

Q. How many miles of main, Mr. Pierson, did you find to exist at that time?

A. I think there was something like between fifteen and sixteen miles.

Q. Did you investigate as to the reservoirs?

A. I did.

Q. How many did you find?

A. I found two reservoirs.

Q. What was the capacity of those reservoirs?

A. My estimate at that time was that the upper reservoir could not possibly contain more than forty million gallons and that the lower reservoir could not possibly contain more than twelve million gallons.

Q. What representation was made to the capacity of these reservoirs by White and Archer?

A. They claimed that they held one hundred and twenty million gallons.

Q. And what did you find with reference to the amount of acreage contained in the watershed that was owned by the Columbus Waterworks Company?

A. I found that the total watershed tributary to Holland's Creek, upon which the reservoirs are located, to be thirty-six hundred and some acres.

Q. Did you find less milage of distribution system or street mains, than was represented by Archer and White?

A. I did.

766 Q. Do you remember how much less?

A. Between one and two miles.

Q. In the maps that they furnished at the time that you went down to make the investigation did you find mains on all the streets that was represented on those maps?

A. No, sir, there was some variations. Some of the streets that I didn't find pipes on—no water takers.

Q. Did they represent that these particular streets did have mains on them, and water takers?

A. The map showed that.

Q. What was the quality of the water that you found there?

A. Quality?

Q. Yes, sir?

A. The quality at that time, at that particular time, was very bad. The reservoirs were low and the water was not good.

Q. Was it wholesome?

A. I didn't consider it so.

Q. How was the supply, the quantity?

A. The quantity was very short.

Q. Was it filtered?

A. Not filtered.

Q. Was there any effort made at that time towards filterarion?

A. In the construction of the upper dam a small basin had been constructed, which I assumed was intended to act as a filter, which had never been used, however, to my knowledge. It was not in use at the time I made my examination.

Q. Was it a perfect filterer; would it have filtered it?

A. By no means.

Q. Did you study the contract that existed between White

767 and the City of Columbus at that time with a view to ascertaining whether or not Mr. White had complied with the terms and conditions of the contract?

A. I did with reference to the ability of the system to conform with the requirements of the fire protection.

Q. What was the result of your investigation on that line, Mr. Pierson?

A. I came to the conclusion that the main leading from the reservoir to the City was large enough to comply with the terms of the contract so far as pressure was concerned at the immediate vicinity of the stand pipe only. That thirty-two pounds pressure, is my recollection, being the required pressure to be maintained throughout the system could not be maintained at any other point on the system except at the standpipe.

Q. For what reason?

A. For the reason that the pipes were too small. The contract required a certain pressure to be maintained. If the domestic consumption, together with an ordinary demand as would be required in the use of a couple of fire streams, were demanded the main was not large enough to furnish more water. Leaving alone the fact that had that fire pressure been sought to be maintained at a distance from the stand pipe, on smaller pipes, it could not possibly have secured the thirty-two pounds pressure. The head would have been entirely killed by the friction in the transmission of the water in the small pipes.

Q. Did you find the reservoirs constructed in accordance with the conditions and terms of the contract?

768 A. I didn't think so.

Mr. Packard objected to the question as leading.

Q. Just in your own way, Mr. Pierson, state how the reservoirs that you found there were constructed?

A. The upper reservoir was built by the building of a stone dam which held back the water. There didn't seem to be any effort after that—having been made to cleanse the bottom of these basins, particularly because the evidences were there. Grass and a bad bottom existing all over the exposed part of the reservoirs. It could be seen at low water.

Q. Was that constructed with marginal depths or thin edges?

A. The contract stated that the reservoir should be constructed with marginal depth. No effort seemed to have been made on the upper reservoir to do that. On the lower reservoir that was carried out.

Q. But was not carried out, if I understand you, on the upper reservoir?

A. Not at all.

Q. How was the system planned as a water works system? I mean to ask you was it well planned or poorly planned?

A. I assume that the works were planned to comply with conditions that were required, or were actually demanded, at the time they were built. Certainly they were not built with any view to future extensions.

Q. Were they well proportioned and designed, or badly proportioned and designed?

A. The pipes were all too small.

Q. Was the system, as constructed, sufficient to deliver
769 such a quantity of water as to afford efficient and satisfactory fire protection?

A. No, sir.

Q. Were the sizes of the mains capable of admitting of future extensions?

A. Oh, certainly you could extend any pipe, of course.

Q. To meet the future demands of the city?

A. No, sir, I shouldn't consider it so.

Q. Was the system, as a whole, adequate and suited to meet the demands and requirements of a city the size of Columbus?

A. I didn't consider it so.

Q. Did you make any investigation, Mr. Pierson, as to whether or not there was any dissatisfaction existing with the people of Columbus as to the quantity and quality of water furnished?

A. Yes, sir, there seemed to be considerable especially among the firemen who were entirely dissatisfied.

Q. Did you talk with any of the citizens of Columbus with reference to the system on that line?

A. I did.

Q. State what was the result of your investigation on that line?

Mr. Packard objected to this as hearsay testimony.

A. The impression I gained was that the dissatisfaction among the people was brought about by the fact of the insufficiency of the quantity of water in the first place, and the bad quality in the second place, both of which were apparent at the time I was there. The firemen claimed that there was no pressure and there was not.

Q. But having seen the conditions existing at that time
770 would you say whether or not the complaints that you heard were based upon any deficiencies in the system? Were they just or not?

A. I think they were, certainly.

Q. Which?

A. I think they were.

Q. Have you investigated this system of waterworks owned by the Columbus Water Works Company at any time since you made this investigation in October, 1890?

A. Yes, sir.

Q. At what time did you look over it again?

A. I think that was September. (Looking at paper which he takes from his pocket.) Yes, sir, on the 18th of September, 1903, I again went over the route of the 12 inch main and out to the reservoir.

Q. Had any changes taken place since you were there before?

A. There were very great changes in the upper reservoir.

Q. What changes did you find to exist in the upper reservoir?

A. Oh, a part of it was filled practically.

Q. With what?

A. With a growth—undergrowth, weeds, rushes, vegetation. In

that one arm when I saw it before—an arm I should say a thousand feet long which held a considerable quantity of water—was entirely filled and nothing remained except weeds and bushes and a little stream.

Q. Did you see any indications of the *detretis* and washings of the watershed into the upper end of the reservoir that you examined?

A. Oh, decidedly yes. It was filled.

771 Q. Just state, Mr. Pierson, in your own way, to what depth it had been filled from your first observation in 1890.

A. Why it certainly had been filled four or five feet. There was that amount of water there at the time of my first visit.

Q. You mean to say where the water was standing four or five feet deep it had been filled?

A. Absolutely filled with washings, and all grown up.

Q. Was there any marginal depth at that time apparent to the upper reservoir?

A. No, sir.

Q. Did you examine at that time as to the character of the water?

A. The character of the water at the time I was there in September was very bad—at least it was very muddy.

Q. Did you visit Columbus at any time, Mr. Pierson, between your first visit in 1890 and the visit just referred to in 1903?

A. Yes, sir, I was at Columbus in November of 1902. No, let me see, when was that I was there? Yes, i*n* was November 1902, that's right.

Q. What conditions were existing there at that time with respect to the water?

A. The conditions then were very bad. So far as the water was concerned you mean?

Q. Yes, sir?

A. Oh, that was horrible. You could not bathe in it. Bad odor.

Q. Do you know where that supply was coming from at that time?

A. It came from the reservoirs in Alabama.

Q. Did it have an odor?

A. Decided.

Q. Was it offensive or not?

772 A. Decidedly. You would not get into it—you would not bathe in it.

Q. Was it pure and wholesome water?

A. No, sir.

Q. Was the character of the water that you saw at that time, Mr. Pierson, fit for any domestic use?

A. It could be made so by boiling, but for ordinary domestic use I should say it was entirely unfit.

Q. I mean without treatment of any sort?

A. No, sir.

Q. Was the water, at that time, being filtered?

A. No, sir.

Q. Did you investigate at that time with reference to the sufficiency of the quantity being furnished?

A. At the time of my last visit?

Q. Your visit in November 1902?

A. No, sir, I paid no particular attention at that time.

Q. Did you go out to the reservoirs at that time?

A. Not at that time, no, sir.

Q. At the time of your first visit in 1890, state whether or not, from the existing conditions at that time, in your opinion, as to whether the quality of the water and the amount of water was wholesome, constant and amply sufficient to meet the wants of the City of Columbus and private consumers?

A. In my opinion I did not find it so.

Q. Was the supply main from the reservoir to the City of sufficient size to supply the consumption and the needs of the City of Columbus and give suitable pressure for fire protection?

A. No, sir.

Q. Were the pipes in the streets that formed the distribution system of sufficient size to furnish a proper quantity of water at
773 sufficient pressure to do effective fire service?

A. They were not.

Q. Why were they not?

A. Too small.

Q. Were they sufficient in size and in carrying capacity to admit of necessary future extensions?

A. No, sir.

Q. What proportion of the system is made up of four inch mains?

A. Oh, twenty-five thousand feet of four inch pipe was represented.

Q. State whether or not four inch mains are large enough to furnish a sufficient quantity of water for consumers and give the necessary pressure for fire protection in a City the size of Columbus?

Mr. Packard objected to the question as leading.

A. No, sir. They are not so considered.

Q. Will six inch mains in a city of that size be large enough to give proper service and feed a system at points beyond?

A. If they were properly fed by larger mains they would.

Q. From having seen the character of water distributed through this system in Columbus would you, or not, say that those pipes have become fouled and polluted?

A. They certainly have become very foul. It is very apparent. It was demonstrated at the hotel where I lived. There was a slight conflagration near the hotel where I lived and the water became so roiled it was absolutely impossible to use it, showing very conclusively that the pipes were foul.

Q. Would it be possible to feed through those pipes a good quality of water, even before it is admitted into them, without the
774 water becoming more or less contaminated?

A. In my experience I have not been able to clean that foul matter from pipes after it has lain for a length of time that

it must have lain in those pipes. You can't blow it out, you can't scrape it out. It's there. Every time a hydrant is opened, no matter if you use spring water, the water would be fouled.

Q. Would it, or not, be necessary to take those pipes up for the purpose of cleaning them—in order to cleanse them?

A. It would not be worth while. They would not be worth it.

Q. From having seen that system in 1890, did you, after having seen it and made your examination, make an estimate of the cost of its construction?

A. I did. I made an estimate of what it could be duplicated for.

Q. What would you say, Mr. Pierson, it could have been duplicated for?

A. I estimated at that time that it could be duplicated for $116,000, which I considered to be a very liberal estimate. I included in that estimate more land than was actually owned.

Q. Would you say that the system could have been constructed for $116,000?

A. Beyond doubt, yes, sir.

Q. Could this system of water works of the Columbus Waterworks Company be reconstructed so as to render it suitable for the needs and demands of the City of Columbus?

A. Of course you could build new waterworks. You mean so far as using those pipes are concerned?

775 Q. Yes, sir?

A. I consider that, in order to put that system in a satisfactory condition to meet the requirements for fire service, it would be fully as cheap to *to* build a new system as it would to try to make those old pipes useful or to work them in.

Q. How many feet, Mr. Pierson, would you say that this reservoir had filled in from your visit to it in 1890 to your visit in September 1903, in length?

A. Oh certainly seven or eight hundred feet.

By Mr. WIMBISH:

Q. Mr. Pierson, were these pipes and mains of cast iron or wrought iron?

A. Cast iron mostly.

Q. What is the life of a cast iron pipe?

Mr. PACKARD: Cast iron mostly did you say?

A. Yes, sir.

Q. What proportion of cast iron and what of wrought iron?

A. What, sir?

Q. What proportion of cast iron and what of wrought iron?

A. I couldn't tell you that, Mr. Wimbish. I don't remember that detail. There were some wrought iron pipes, service pipes, in some places that were considered at that time as the same as cast iron pipes.

Q. Can't you give us an estimate of what proportion there was of wrought iron? Was there half?

A. Oh, mercy no. Very small proportion.

Q. Ten per cent?

A. I should say not.
Q. Not as much as that?
A. I couldn't answer that question with any accuracy.
Q. In your opinion there was not more than ten per cent?
A. Oh, no.
776 Q. What is the life of a cast iron pipe?
A. Well, they have dug up pipes in New York City that have been under ground for seventy years.
Q. Cast iron?
A. Cast iron pipe.
Q. Is there any estimate made by engineers of the life of a cast iron pipe?
A. The cast iron pipe—the life of a cast iron pipe depends entirely upon the quality of the water that passes through it. If the quality of the water is good the life of a cast iron pipe is unlimited. If the quality is bad, the pipe may deteriorate in five years and may be entirely gone in ten.
Q. Well, you are familiar with the character of the water passing through the cast iron pipes in Columbus. What would you say would be the life of those pipes—cast iron pipes—conveying that water?
A. I should say that those pipes that are filled with the sediment—that being of the nature of fine clay it would adhere to that pipe to such an extent that it would be impossible to remove it at all. So that, although the iron in itself may not have deteriorated, the pipe would be useless.
Q. In what length of time would you say that the pipes had become practically useless?
A. Well, the condition of those pipes there shows that they are pretty well filled. I should not like to put a value on the pipes in Columbus.
Q. The object of my question, Mr. Pierson, is to determine whether it would be necessary to relay those pipes in order to
777 provide a sufficient system for that city?
A. Why it certainly would.
Q. It certainly would?
A. Yes, sir.
Q. Did you examine the quality of the Chattahoochee River water when you were there?
A. I did, sir.
Q. Are you familiar with the modern methods of filtration?
A. Yes, sir.
Q. And you examined the filtration Plant now existing at Columbus?
A. Yes, I was there at the time they were building it.
Q. Is that river water fit for domestic and culinary purposes without filtration?
A. There may be some times of the year that it could be used, but I have never seen it. In my experience with the Chattahoochee I found it always the same—very muddy, very unfit for use.

Q. What would be the effect of filtration with respect to its fitness for domestic use under modern methods?

A. It could be filtered.

Q. Could it be filtered and made a wholesome and pure water?

A. I could not say as to that.

Q. Suppose, Mr. Pierson, that that water was filtered and made a pure and wholesome water and was then distributed throughout the City of Columbus with the system that they now have, could it be delivered as pure and wholesome water, or would it become contaminated by passing through those pipes?

A. It certainly would. It is a hard matter to state how long, if it were possible, it would take to remove mud from pipe. I have kept a pipe under pressure that has been fouled in the manner in which those pipes must be, with clear water for a month. If the
778 pressure was constant the water would run clear. If the pressure varied the water would become roiled; therefore, at any time when a hydrant should be opened in Columbus the water would become roiled, in the small pipes.

Q. Did you observe where the intake of water from the river was for this new filtration plant?

A. I did.

Q. Well, do you know whether that was within the limits of the town—I don't mean corporate limits of the city, but I mean the populated limits?

A. Yes, sir, it was directly within the populated district.

Q. Well, was the water at that point at all affected by surface drainage or sewerage?

A. It was the opinion that such conditions might be, inasmuch as there was a large sewer in the immediate vicinity.

Q. Would you say that water taken from that point would be wholesome?

A. I should say not. I should say it would be almost impossible to make it wholesome at a time when the river was in what I would call its normal state—almost muddy. There may be a time when the Chattahoochee is clear. I have never seen it. The slightest rain there, brings down quantities of this alluvial matter—the red clay that abounds in that vicinity and carries with it in that particular point the drainage of all that north-eastern portion of Columbus. It probably would be impossible to get good water from that point.

Q. Mr. Pierson, if cast iron pipes should become encrusted by a deposit of mud and other inorganic matter from unwholesome water, would it, or not, become a repository for disease germs?

779 A. It certainly would. The water shows it. I smell- and there is disease in it. It is vile; fouled; you can almost detect the sewerage matter.

Q. How long would those disease germs retain life, even though you should subsequently put pure water through those pipes?

A. It is hard to tell.

Q. Would it be definitely or indefinitely?

A. Oh, at the dead end of a pipe on a long main having no circula-

tion the water would certainly get septic; that pipe is neither more nor less than a septic tank. Septic action would take place in the water in that pipe. The odors that would come from it would be precisely similar to those that you detect from the decomposition of sewage matter. It is a hard matter to tell to what extent; a hard matter to tell what disease carrying it might do, the time it would take or how long it would take it to produce disease. But if left alone, it certainly would.

Q. What are dead ends?

A. Dead ends are pipes that terminate in a hydrant, having no means of circulating water around through other pipes.

Q. What effect has dead ends in the waterworks system and especially so where the pipes are four or six inch mains—small pipes?

A. They very soon fill.

Q. Does that increase the accumulation of offensive matter in pipes?

A. Very fast.

Q. What effect does it have upon fire pressure in that vicinity?

A. The pressure would be affected very materially. Dead ends on a length of pipe is something which has been brought about
780 by a demand for a hydrant at a certain place and no particular demand for domestic consumption.

Q. Suppose, Mr. Pierson, that there was a hydrant located on a four inch pipe that had free and continuous circulation and another like hydrant located at the end, or near the dead end of a four inch pipe; what would be the relative effect on the fire pressure?

A. Why the pipe that had the circulation would give you twice the effect of that which comes from the dead end. It would be supplied from both ways with water. In the case of a dead end water could only be obtained from one direction.

Q. Did you find many dead ends in the Columbus system?

A. Well, I couldn't answer that question certainly. There were some.

Q. After you made your examination, Mr. Pierson, did you make a report to Coffin & Stanton?

A. Yes, sir.

Q. Have you that report?

A. I have not.

Q. Have you examined to see if it could be found?

A. I did.

Q. Could you find it?

A. I found a reference to it. I found data that I made at that time which was included in the report which I made.

Q. What was your report? I mean by that, how did it compare with the conditions as you have testified to as having found them?

A. Very generally.

Q. Favorable or unfavorable?

A. Yes, sir.

Q. I say favorable or unfavorable?

A. Unfavorable.

Q. What was the action of Stanton & Coffin?

A. Nothing was done.

781 Q. What do you mean by that? Did they decline?

A. They declined to purchase.

Q. Do you remember the price at which the property was offered by the then Columbus Waterworks Company?

A. Three Hundred thousand dollars was the amount.

Q. They asked for it?

A. Yes, sir.

Q. Do you know the firm of Wilson, Adams & Company, or Wilson, Colston & Company?

A. Wilson, Adams & Company at that time. I have not been particularly acquainted with them.

Q. But you knew of such a firm in Baltimore?

A. Yes, sir.

Q. Was that the same firm as Wilson, Colston & Company, or the predecessor of that company?

A. Wilson, Colston & Company, I understand, are the successors of Wilson, Adams & Company, or Wilson & Adams, I don't just remember how they styled it.

Q. Were any of these Columbus Waterworks bonds ever offered by either of those firms to Coffin & Stanton?

A. I can't swear to that, sir.

Q. Well, you state to the best of your recollection and the circumstances on which you base it?

A. To the best of my knowledge and belief.

Q. Can you state any fact—or can you state whether Wilson, Adams & Company, or Wilson, Colston & Company, had notice or knowledge or information of your visit to Columbus and your unfavorable report; or that an examination had been made and an unfavorable report made on that system?

A. I couldn't swear that they did. I made my report and the matter was turned down. That was all there was to it at that

782 time. I had nothing to do with the financial part of it.

Q. You had no personal communication, then, with Wilson, Colston & Adams?

A. No, sir, none whatever.

Cross-examination by Mr. PACKARD:

Q. Did you say that you have been engaged in the construction of waterworks for many years. Do I understand that you feel yourself qualified to speak also as a medical expert?

A. I should not offer my service as such an expert, sir.

Q. You have spoke*d* of certain propositions made to the firm of Coffin & Stanton by Archer and White. Do I understand that those propositions were in writing?

A. Yes, sir I hade those papers given me.

Q. Do you remember the date of those papers?

A. No, sir.

Q. You spoke of your visit as having been made—your first visit to Columbus as having been made in October, 1890?

A. Yes, sir.

Q. How long previous to that visit that the papers were submitted?
A. I couldn't answer that sir.
Q. Within two years?
A. Oh, yes, sir.
Q. Within one year?
A. I should say they came in my possession less than a month previous.
Q. That is not the question. The question is as to whether or not you recollect the date of the written proposition made by Archer and White to Coffin & Stanton?
A. I do not.
Q. You cannot say whether it was in September 1890 or September 1889?
A. No, sir.

783 Q. Did you state that on your visit in October, 1890 you ascertained the capacity of the reservoirs to be fifty million gallons?
A. Yes, sir.
Q. Please state how that calculation was made, giving data on which you made it?
A. I took a boat and sounded the reservoir and from it got an average depth as close as I could.
Q. Anything further in the way of investigation or data for your calculation?
A. At the reservoir?
Q. Yes, sir?
A. No, sir that was all I required there. Of course, I had the plans which gave me the length of the dam and the details of its construction and all those matters.
Q. Had you the acreage of the reservoir?
A. The acreage was given in the statements given to me.
Q. Did you verify the acreage?
A. I couldn't verify it.
Q. Why not?
A. It wasn't there.
Q. Did you make any measurements to ascertain the acreage?
A. I ascertained the length and breadth of the reservoir and computed the area from that.
Q. By measurement?
A. Yes, sir.
Q. How did you make your computation of the acreage contained in the watershed supplying Holland's Creek?
A. From a survey which had been made, which gave the entire watershed tributary to that creek, which I availed myself of.
Q. Your calculation was made on that survey?
A. Yes, sir.

784 Q. Do I understand that with the same data the result which you reached in acres was less than half of that which had been furnished by Archer and White?
A. Yes, sir.
Q. Are you able to state what proportion of the water systems in

use for the supply of cities and towns in the United States have connected with them, as part thereof, filtration systems of any kind?

A. I couldn't answer your question, sir.

Q. In those which have been constructed by yourself what proportions have filtration systems?

A. Probably one fifth.

Q. In the case of that one-fifth what is the size of the town and what is the character of the water supplied, or the source of the water supplied?

Mr. Wimbish objected to this on the ground that it is immaterial inasmuch as the contract in this case requires filtration.

A. The water in these cases, sir, was of a muddy nature which absolutely required filtration before it could be used. The waters in Missouri, the Ohio, the waters of the Raritan in New Jersey.

Q. Do you happen to know whether the city of Baltimore has a filtration system for its waterworks, which is owned by the city?

A. I am not familiar with the waterworks in Baltimore. I understand that they have a very delightful supply of water which is almost pure in itself.

Q. You have spoken of the size of the City of Columbus. Will you be good enough to state its population in 1890, when you
785 were first there and its population in 1900?

A. I couldn't give you the population in 1890. The 1900 population is given, I think as about 17,000.

Q. Seventeen thousand?

A. Yes, sir.

Q. Do you know what proportion of that number are blacks?

A. A large proportion.

Q. As much as half, would you suppose?

A. It looks that way. It is pretty hard to tell.

Q. What is the comparative use of water by whites and blacks in a city like Columbus?

A. Oh, a hundred per cent. in favor of the whites I should say.

Q. Your next visit, as I understand, was in November, 1902?

A. Yes, sir.

Q. At whose instance did you make this visit to Columbus at that time?

A. I was sent to Columbus by a gentleman to report to him on a source of water supply which he thought might be available for the City of Columbus.

Q. Was this a new source of supply?

A. Yes, sir.

Q. Please state what source of supply this was and who was the gentleman at whose request you made the investigation?

A. The source of supply came from the Pine Mountains in Harris County. The gentleman who sent me was William C. McFarland of this City.

Q. The source of supply from the Pine Mountains made its appearance at Blue Springs or in that neighborhood?

A. Yes, sir that immediate vicinity.

Q. That was that is generally known, then, in Columbus as the "Blue Springs Plan" was it not?

A. Yes, sir, yes, sir.

786 Q. Your third visit was on September 18, 1903, as I understand?

A. Yes, sir.

Q. At whose instance was this visit made?

A. The same party.

Q. Was it with a view to suggesting or proposing to the City of Columbus a water supply from the Blue Springs at this time, as well as at your first visit? Or did you include in your suggestion some other source or supply?

A. The proposition to the City of Columbus was never made by Captain McFarland for that as a source of supply. It was intimated by him that that was a source from which a supply could be obtained.

Q. My question is whether at your second visit you suggested any other or different source of supply from the Blue Springs plan?

A. I did not.

Q. Did you, as representing Captain McFarland, have conferences on this subject with members of the Water Committee of the City of Columbus? or with any other public functionaries of that City interested in the question of waterworks?

A. I did. I met the Committee at the time of my last visit.

Q. In September, 1903?

A. Yes, sir.

Q. You have spoken of a cast iron pipe that was taken up in New York laid seventy years ago, but you omitted to state what I think you meant to say, that the pipe was in good condition. Am I correct in that supposition?

A. The iron was found to be in unusually good condition,

787 but the pipe was useless. Filled with mud. Outside and in. Still, the iron remained.

Q. Have you made any actual, visual examination of any of the pipes in the City of Columbus?

A. I have not.—Oh, I beg your pardon, I have. I have seen a piece of pipe shown me by the firemen there which was taken up.

Q. Do you know from what point it was taken?

A. I do not, no, sir.

Q. Then you only know from the statement of the firemen that it was a part of the pipes of the City of Columbus?

A. I was so told, yes, sir.

Q. You have stated that the firm of Wilson, Adams & Company, who, you state, were predecessors of Wilson Colston & Company, had communications with Coffin & Stanton on the subject of the bonds of the City of Columbus. When were those communications made by said firm of Wilson, Adams?

A. I couldn't tell you, sir.

Q. How do you know that such a firm got into communication with Coffin & Stanton?

A. It was my understanding that the proposition came from them.

Q. It was your understanding?

A. Yes, sir. I had nothing whatever to do with the financial part of the business.

Q. Did you see any written communication from the said firm of Wilson & Adams, or from any other firm in Baltimore, in regard to these bonds?

A. I did not.

Q. You have stated that the firm of Coffin & Stanton were connected with a large number of waterworks enterprises. Do you remember, in a rough way, how many such works they were

788 connected with?

A. Oh, probably twenty-five or more.

Q. Are the water works system of Topeka, Kansas, one of the——

A. Yes, sir.

Q. —said water works in which they had an interest?

A. Yes, sir.

Q. You have said that on your first visit to Columbus in October, 1890, certain persons expressed dissatisfaction with the quality of the water furnished by the Columbus Water Works Company. Are you able, at this time, to mention the name of any person who expressed such dissatisfaction?

A. No, sir, I couldn't.

Q. Did you make on your visit in September 1903, any examination of the pumping station recently installed in connection with the water works system of Columbus?

A. Yes, sir, I visited it.

Q. You have stated that the filtration plant was then installed. Do I understand you to say that it was then in operation?

A. No, sir, they were just erecting it. The tanks were not finished; the filter plant was not finished; the pumps were simply being put on their foundations. That was the condition of the work at the time I was there.

Q. When your visit occurred in October, 1890, was there any pumping plant in connection with the system at that time?

A. Not to my knowledge, no, sir—Oh, in 1890?

Q. In 1890 was there any pumping plant in connection with the system?

789 A. Oh, yes, sir, there was a small pump located near the railroad track which was used to pump water, I think, into the standpipe at Rose Hill. I didn't see that though. I simply drove by it and didn't see it in operation.

Q. Do you remember, however, seeing the standpipe at Rose Hill in October, 1890, when you were there?

A. Oh, yes, that was there.

Q. What was the difference between the——

WITNESS: 1890?

Q. Yes, sir?

A. No. The standpipe on Rose Hill was not there in 1890.

Q. You spoke of seeing a pump in 1890?

A. Pardon me, I mistook your date. There was no standpipe or no pump in 1890. In 1893—I should say in 1903—the standpipe at Rose Hill and the pump were in existence, but in 1890 there was nothing. I misunderstood your date.

Q. I understood you to say that on your visit in September 1903 you found another pumping plant established in place of the smaller pump that had previously existed. Am I correct in that inference?

A. I am not sure whether there were two new pumps, or whether one pump had been moved in. I found two pumps that were being put on foundations and whether one was one which had been used at another point I couldn't tell you. In all probability it was. But I couldn't state as to that.

Q. Do you know whether there was any pump used in connection with the system in November 1902, the date of your second visit?

790 A. There was a pump there, yes, sir.

Q. Pump there?

A. Yes, sir, over by the railroad. I don't remember the street.

Q. What I wish to ascertain is whether or not that pump, or the pumping system had been started in connection with the works since the date of your visit in October, 1890?

A. Yes, sir, the new pumping system has.

Q. What did you think as to the character of the water in September, 1903 as compared with the character of the water in November, 1902, with respect to potability and general use?

A. I saw no difference, sir.

Q. To go back for a moment. I understand that you stated that Archer and White had represented that they had seventeen miles of main constructed and that you found between fifteen and sixteen miles. Am I correct in that understanding?

—. Yes, sir, that is the mileage that I found upon the map.

GEO. H. PIERSON.

791 I, William Becket Harding, a duly commissioned and acting Notary Public, in and for the City, County and State of New York, and as such authorized by the laws of said State to administer oaths and take depositions, Hereby certify, that the foregoing typewritten pages contain a full, true and complete record, by questions and answers, of the evidence given by the witness, George H. Pierson, at the time and place herein above named, in my presence and in the presence of counsel representing the complainant and the defendant, the City of Columbus. That said testimony was stenographically reported by A. A. Dean, and by him written out, after which it was read over approved and subscribed by the witness in my presence.

Given under my hand and Notarial Seal, at the City of New York, on this the 28th day of January, 1904.

[SEAL.] WM. BECKET HARDING,
Notary Public, Notary Public, *Kings County, N. Y.*

Certificate filed in New York County.

Stenographer's Fee	$25.00
Notary's Fee	20.00
Total	$45.00

792 STATE OF NEW YORK,
County of New York, ss:

The Undersigned, A. A. Dean, being duly sworn deposes and says: That he stenographically reported the foregoing testimony of the witness named, George H. Pierson, and wrote out the foregoing record thereof, and that said record contains a full, true and complete statement of the testimony by questions and answers.

A. A. DEAN.

Sworn to and subscribed before me this 27th day of January, 1904.

[NOTARY SEAL.] WM. BECKET HARDING,
Notary Public, Notary Public, *Kings County, N. Y.*

Certificate filed in New York County.

793 Mr. WIMBISH: We now tender so much of the extracts from the Minutes of the proceedings of council as are included in the transcript already read that has not been introduced in evidence by the gentlemen on the other side.

The MASTER: Without objection that will include the whole of that paper.

Mr. WIMBERLY: We will in the main argument argue the legal effect of it.

The MASTER: I don't mean it is your evidence; but evidence put in on both sides.

L. H. CHAPPELL, sworn by respondents, testified as follows:

(By Mr. WIMBISH:)

Q. How long have you been Mayor?

A. Since December, 1897.

Q. Did you have any official connection with the city prior to 1897?

A. Yes, I was a member of the Board of Aldermen in 1889, I think it was—somewhere along back there. I don't remember the exact date—perhaps '88 and '89, two years.

Q. For a term of two years?

A. Two years, yes.

Q. Have you examined the reservoirs and plant of the Columbus Water Works Company: When was your first acquaintance with it?

A. Well, I don't remember the first time I ever saw it. A good many years ago. Long before I was Mayor. Along back in the eighties.

A. No, sir.

Q. A little hydrant three quarters of an inch never would throw a large stream, would it?

A. No, sir; I don't suppose it would.

Q. Water splits up in the air where streams are that small?

A. Ought to throw water 25 or 30 feet high, I imagine.

Q. Did you ever see any used at a fire at all?

A. I suppose they have been used.

Q. I mean you yourself ever seen them?

A. No, sir.

Q. Q. From your own knowledge of the subject you are not prepared to say that a hydrant like that would throw a stream even as much as 20 or 25 feet?

A. I have seen them throw further than that. We have one.

Q. You mean vertical height?

A. Yes, sir.

Q. Were there any fire engines used at that same fire?

A. Yes, sir.

Q. How many?

A. Started I think with two; but when the girls school caught afire they ordered out the next one.

Q. Were those engines attached to the same pipe that this little hydrant led out from?

A. I don't know, sir. They were attached to city hydrants located at different points.

Q. On the same line of pipe?

A. I suppose they were.

Q. Do you know what size pipe it was?

A. No, sir.

881 Q. You know that 2 or 3 engines under steam pressure, drawing water out, wouldn't leave any water to go to a little hydrant in a yard, would it?

A. I am not sure whether it would or not. Depends upon the quantity of water in the pipe. Of course if there was a larger pipe it would supply the engine and still would leave water for smaller hose too.

Q. The only stream at that fire that you noticed didn't have pressure was that little yard hydrant, is that right?

A. That was brought more particularly to my attention just at that time.

Q. Did you notice any more during that fire?

A. I noticed at these houses right across the street from the fire had great difficulty in getting water to keep the roofs wet. In fact I was up on the roof of Mr. Edwards' house, the one he was living in, and we had great difficulty in getting water to put the fire out. At times had 3 or 4 of them.

Q. How did you try to get water, from the fire engines?

A. No, sir; had buckets.

Q. It is a fact, isn't it, that when 2 or 3 engines are drawing water under steam pressure out of a small pipe, it leaves very little pressure outside?

A. Yes, sir; greatly reduces the pressure.

Q. There were three engines working at that time?

A. I don't remember whether they were working just at that time or not. Probably 2 of them were at work and the other one was called in.

Q. You said there were three?

A. Three on the fires. At this particular time the third engine was not called out, according to my recollection, until the
882 girls public school caught on fire.

Q. You are unable to say that there was any defect in pressure before the engines began to exhaust the pressure by the use of the water? themselves at that fire?

A. I suppose if they had used that yard hydrant before the engines were there it would have afforded water.

Q. You saw nothing to indicate to the contrary?

A. No, sir.

Q. Did you see any defect of pressure before the engine drew the water out?

A. No, sir.

Q. That's the only fire you specified in your direct examination back of 1902: Roe Edwards, you didn't give the date of that?

A. That was the same fire. Roe Edwards lived just across the street from the 5th Avenue fire.

Q. There was one other fire, the mattress factory, that you described?

A. Yes, sir.

Q. What was the date of the mattress factory fire?

A. I think that was in 1902, my recollection of it.

Q. What was the size of the mattress factory that burned up?

A. It was a small factory.

Q. About how big: it was not as big as the Eagle & Phenix, was it?

A. No, sir; a small factory in the rear of the yard.

Q. What size building was it, as big as the court house?

A. O, no, sir; a small building.

Q. Just give in feet about the dimensions?

A. I don't suppose the building was ever 30 or 40 feet long. Small building.

883 Q. How many stories high?

A. One story.

Q. Frame or brick?

A. Frame.

Q. What was its contents?

A. Its contents, I suppose was such as they make mattresses out of.

Q. What do they make mattresses out of, cotton and feathers?

A. Yes, sir.

Q. Rather inflammable, was it not?

A. Yes, sir.

Q. A small building like that filled with inflammable material would burn up before you could get in much work on it?

A. Yes, sir; it would burn rapidly.

Q. That was one fire at which the mattress factory burned up?
A. Yes, sir.
Q. Did anything else burn up except that little mattress factory?
A. Burned the roof off the residence.
Q. They were able to stop the fire on the residence after the roof burned?
A. Yes, sir; pretty well. The upper part of the house was burned off.
Q. Frame building?
A. Yes, sir.
Q. Were the walls covered with anything?
A. You mean the outside walls?
Q. Yes?
A. Weatherboarding.
Q. Wasn't it covered with some kind of iron or tin?
A. Not that I remember, just a frame house.
Q. How about the roof, a shingle roof?
A. Shingle roof, yes.
Q. They stopped that fire after it got under good headway?
A. Yes, sir; the mattress factory was burned and the roof was burned off the house.
Q. Did they use the engine at that fire?
A. Had one engine located on 6th Avenue playing on the
884 mattress factory and had another one on 5th Avenue playing on the house. Think probably two on the mattress factory at one time but I am not sure about that.
Q. You spoke of the mattress factory burning up, were they not playing their water as high as the top of the factory?
A. Think they were, yes.
Q. No lack of water pressure made that mattress factory burn up?
A. No, sir; I suppose that would have burned any way. I believe though that they could have saved the roof of the residence had the system been able to have given a good supply of water.
Q. You say they were playing on the residence: you get that by what they told you?
A. No, I was standing right there looking at the engine pumping water and there was no water coming from it.
Q. Both of those engines were on the same line of pipe?
A. I don't know about that. One was on 5th Avenue and the other on 6th is my recollection.
Q. How far was the closest hydrant to this house that the top was burned off?
A. Probably 150 feet. Something like that. Right close to the house.
Q. I believe it was at the Columbus Iron Works fire where you saw some women with barrels of water: What streams of water did you see at that fire?
A. I think there were at least two engines at work on that.
Q. Wasn't there more than two?
A. Possibly so.
Q. Any other streams playing on that except the two engines?

A. I think not.

885 Q. The engines threw good streams of water, didn't they?

A. I was at these houses most of the time trying to keep them from catching. If they had caught there was some valuable property in the rear of them.

Q. Any streams playing on the houses?

A. No, sir; the citizens took charge of them.

Q. Took charge of that with buckets?

A. Yes, sir.

Q. The buckets threw water all right?

A. Yes, sir; the buckets did very good work. Saved the houses, in my opinion.

Q. That's all you had working on those houses where you had buckets: you didn't have any fire engine or hose?

A. No, sir.

Q. There was no defect of pressure that caused any harm that you saw at that time?

A. It was a difficult matter to get water on the roofs of the houses.

Q. What did you draw your water out of?

A. Had some barrels filled up with water and dipped it up in buckets.

Q. You say it was difficult to get it: why was it difficult to get it?

A. Small hydrants wouldn't throw the water.

Q. Small hydrants: they were these small hydrants like you have in the yard?

A. Yes, sir.

Q. Do you know whether they were new or old?

A. No sir.

Q. Or whether they had rusted out?

A. No, sir.

Q. You never — any examination to see?

A. No, sir.

Q. Do you know whether they were connected with the Columbus Iron Works' standpipe or the water works?

886 A. I do not.

Q. You don't know which system they were connected with?

A. They must have been connected with the city. The Iron Works is not in the business of furnishing water.

Q. They have a standpipe there?

A. I don't remember their having it. They might have had it.

Q. Right across the street from this place?

A. Just across the street.

Q. The only thing that you spoke of there in the way of pressure were these little fixtures, ¾ of an inch or one inch?

A. Yes, sir.

Q. You know it is a fact in any sort of a system, when you couple on to fire plugs between the source of supply and the little streams running in the yards, it cuts off the pressure in the yard for the time being?

A. It does to a great extent, reduces the pressure; but I see no

reason why it should stop the flow of the water entirely if the pressure is sufficient to afford the engines with water and still leave water enough——

Q. It would depend upon the number of streams and quantity they were drawing out and as to the number and size of pipes?

A. A greater number of streams would reduce the pressure that much.

Q. Of course an engine with its steam power would get its water first and then these others would only get the leavings?

A. Naturally the water would flow to the suction.

887 Q. The force of the suction would pull the water from the little hydrants?

A. Yes, to some extent.

Q. By causing a vacuum between?

A. Yes, sir.

Q. So *so* far as you speaking of the pressure failing was the little yard faucet there—these small, little yard faucets: Those are the only fires you mentioned in your direct examination, where you had noticed any defect of pressure: You have seen quite a number of fires in the twenty years you have been in Columbus?

A. Lots of them.

Q. In addition to those you have specified where you saw little yard hydrants that did not seem to give much water while the steamers were running, you have seen a great many other fires?

A. Yes, sir: and I have seen a great many of them where the hose was attached to the mains without the use of the engine and they could not reach the roof of a one-story house.

Q. Can you mention any one of that sort?

A. I don't re-call just now any particular instance, no further than the Watt fire.

Q. Which fire was that?

A. At the Watt house across the street from us; and then another fire at the Huff place right across the street from where we live.

Q. Can you mention any more?

A. A good many others. I can't recall them exactly. I have seen them frequently put the hose on ladders and carry the hose right up to the fire for the lack of pressure. It has been done often.

Q. Why was it in specifying defects this morning you only

888 mentioned these others?

A. Those were more prominent fires that occurred to me. I have seen numerous fires—in fact it was a universal custom almost for the fireman to carry their hose right up to the fire on ladders.

Q. Don't they do that everywhere: and ain't that a good way to fight fires?

A. If they had sufficient pressure they could, after the fire catches on the roof, they could stand on the ground.

Q. Ain't it a fact that the closer you get to the house the more force you have with your stream, with the same size nozzle you can always throw it with more force where the nozzle is closer to the blaze?

A. Yes, sir.

Q. Whatever the amount of pressure may be, as good firemen who do their work rightly, will carry their nozzle as close to the fire as they can get it?

A. Yes, but there is a great loss of time in doing that, if they could reach it from the sidewalk it would be better.

Q. Don't you know that every fire you have seen in Columbus, and everywhere else, that is the way they do, that they carry the nozzle up where they can play closely on the fire?

A. I don't know that they do it in other places, where they carry it up on ladders to get to the fire.

Q. Did you ever see them fight fires at other places?

A. Yes, sir.

Q. Don't they have a hook and ladder company for that
889 purpose?

A. Yes, sir.

Q. Isn't it a fact that every fire department has a hook and ladder company for that purpose?

A. I don't know that they are for that purpose.

Q. Don't you know from your experience as a fireman——

A. I say if they could reach the fire from the sidewalk, they could put it out before they could get ladders to put it out. Frequently the hook and ladder part of the department is behind time. Don't get there promptly; and it has been the custom*er* of the firemen here pretty much altogether, even on one story houses, frequently they will carry the hose up on a ladder to reach the fire on a one story house. They do that frequently. I saw that on a two story house *c*here where Mr. Barlow lived about two months ago, they carried the hose up on ladders. If they had sufficient pressure to reach the fire in its incipiency they could save lots of time.

Q. Isn't it a fact that the closer you can get the nozzle to the fire, the more better you can direct it, that is, to the very point where it is ablaze; and in that way get the best effect of the stream?

A. I don't believe that is a fact at times. I believe if they were not quite as close, if the fire was on the roof, it would give the water a chance to spread over more space, that is, in its incipiency and they could put it out better from the sidewalk, if they had the pressure promptly, than by dragging the hose up there; but generally
890 speaking your proposition is correct.

Q. You speak of incipiency: as a matter of fact fires generally get under headway before you get to it, does it not?

A. Generally gains some headway, yes.

Q. You judge that they do that from the lack of pressure and not because it is the method of doing it: Do you remember any fire at which you have seen them throw a stream from the ground where it did not rise high enough?

A. I have seen them try frequently and fail.

Q. Can you mention any fire where you have seen them do that and could not reach it?

A. Yes, at this Huff fire.

Q. Mention another?

A. I don't remember just now. If I could remember the fires I could tell. I don't re-call just now the various fires.

Q. You were an alderman?

A. Four years.

Q. The fire chief makes his annual reports as to pressure?

A. Yes, sir.

Q. The fire department are better in a position to know, are they not, when the pressure is satisfactory and when it is not?

A. Yes, sir.

Q. You have seen, as member of council, when they made these reports—annual reports?

A. I saw it during the years I was a member of council.

Q. You never questioned the correctness of those reports, did you?

A. Well, I thought the reports were a little biased. The
891 chief of the fire department at that time was Mr. George Burrus.

Q. Which time?

A. During the time I was a member of council. They were made by Mr. George Burrus, who was clerking in Mr. Foley's store; and Mr. Foley was connected with the water works company—interested.

Q. You never made any change in your fire chief?

A. No, sir; we were in the minority in council most of the time.

Q. You were not in the minority when you got through this resolution of 1894?

A. No, sir.

Q. You were not in the minority when you got through these resolutions in 1895?

A. No, sir.

Q. You were not in the minority in 1893 when you got Mr. Hall down here to make these surveys?

A. No, sir.

Q. What years were you in the minority: You were not there but four years?

A. No, sir.

Q. What year was it you were in the minority?

A. I am speaking of the people that favored a new system of water works. Generally they were in the minority.

Q. You got through your resolutions in '95 without any trouble?

A. Yes, sir.

Q. You got your resolution through in '94 by a big majority?

A. Yes, sir. Went through with a majority.

Q. You got Mr. Hall down here with a majority?

A. Yes, sir.

Q. Do you remember a vote in which you ever went into in this water works matter that you were in the minority in those
892 four years?

A. I don't refer particularly altogether to the time I was a member of council only.

Q. I am asking you——

A. (Interrupting.) That's true.

Q. During the time you were a member of council—I am asking you about Mr. Burrus: You never found any fault with Mr. Burrus and tried to re-place him with anybody else, did you?

A. No, sir; we didn't feel like we could do it.

Q. You mean to say you didn't think Mr. Burrus made truthful reports to council?

A. No, I won't put it that way. I say Mr. Burrus' reports before the time the present water works company got possession of the water works were very different from Mr. Burrus' reports after they did get possession.

Q. I will let you refresh your recollections about the reports and see if you are not mistaken about that: Isn't it a fact that the reports were about the same the whole time: Have you examined these reports to see?

A. I refer to the reports of Mr. Burrus in which he condemned the four inch mains.

Q. What report do you refer to in which he condemned the four inch mains: What date was that?

A. That was before the present company got control. I don't remember the exact year.

Q. That was way back of '91?

A. Yes, sir; I think it was. I don't remember the exact year.

Q. What year?

A. I think probably about '86. I know Mr. Jordan con-
893 demned the four inch mains and his report will bear me out in that. Mr. Burrus also made a report where he said the building of this standpipe didn't add to the pressure.

Q. What year was that?

A. That was before the present company got in charge. His report will bear me out in that.

Q. What year: You mean before '91?

A. Yes, sir.

Q. The reports will speak for themselves?

A. They were printed in pamphlet form.

Q. You are giving your recollection of those reports?

A. Yes, sir.

Q. Mr. Rankin, when you speak of Mr. Burrus being prejudiced, don't you mean that he was not as bitter against the water works company as you were; that you took the lead and went further?

A. I didn't say that Mr. Burrus was prejudiced. I said the tenor of his reports before the present company got possession of the water works was different from the tone of his reports after they got possession.

Q. Mr. Pierce, you don't mean to say that his reports were untruthful?

A. I don't know that I examined any of Mr. Pierce's reports. I don't know what his reports were.

Q. The fire chiefs are in a better position to judge as to the sufficiency of the pressure than you are?

A. Yes, sir.

Q. You never at any time when you were in council ever questioned the correctness of any of the reports?

A. I don't know that I ever took any action.

Q. They were accepted as truthful and correct and coun-
894 cil acted on them?

A. Yes, sir.

Q. You spoke of complaints: How were those complaints made?

A. It was complaint generally among the citizens.

Q. Complained to one another or complained to anybody?

A. Well, there was a pretty general complaint on the part of the people.

Q. What do you mean by complaint—complaint to who?

A. I heard these complaints or discussions—town talk.

Q. To get at something definite: They ever complain to council?

A. I suppose they have done that.

Q. Do you know of any complaint to council by the citizens?

A. Well, complaints was the reason why these ordinances were introduced.

Q. I will ask you this question: did you, yourself, in '90 hear of any of these complaints or know of any by the citizens to council?

A. Well, I know that there were complaints but I don't remember now that they came particularly to me.

Q. In '90?

A. I don't remember whether it was that particular year or not. More or less complaints ever since the system has been built. Before the present company got charge and since that time.

Q. You mean there has always been some sentiment here for municipal ownership?

A. No, I don't mean that.

Q. You mean before the contract was made in '81 the town
895 was divided as to whether to contract with another or build for themselves?

A. I don't know. I don't remember any movement on the part of the people, advocating the city's owning its own works.

Q. You don't know that that was one of the complaints before they entered into the contract or not?

A. No, sir; I don't remember that. May have been such a movement but I don't remember it.

Q. You never yourself in '90 had council to take any action in the matter, did you?

A. No, sir.

Q. You never tried to get council to take any action, did you? You don't know of anybody that tried to get council to take any action, in '90?

A. I can't re-call any one.

Q. In '91 did you try to get council to take any action?

A. I don't remember any.

Q. Do you know anybody that tried to get anybody to take any action?

A. No, sir.

Q. Or in '92?

A. No, sir; I don't remember.

Q. When these resolutions were prepared in '94 and '95, in which you stated the city had no authority to make this contract without submitting it to a popular vote: Did you prepare those resolutions?

A. No, sir; I did not.

Q. Who prepared them?

Objected to as immaterial.

The MASTER: You can ask him if they were based upon any formal complaint lodged with that body.

Q. Where did you get the information that the contract was not good unless submitted to a popular vote?

896 Objected to as immaterial.

The MASTER: You can ask if any formal movement was taken.

Q. This resolution of 1894 about not being submitted to a popular vote, when was the matter that led to that resolution first brought about?

A. The first that came to my attention was that the people were holding mass meetings to investigate this question; and being a member of council——

Q. (Interrupting.) To investigate the question of municipal ownership?

A. No, sir; to investigate the question of defects in the present system and to remedy them.

Q. When was it you had the mass meeting?

A. I think it was in '93 or '92—I mean '92 or '93.

Q. Where was any mass meeting held?

A. Had several of them on Rose Hill, at Newman's Pavilion and had some down town here. Some I attended and some I did not.

Q. The Rose Hill people didn't have any water at that time?

A. No, sir; the movement started down town as well as up there.

Q. What led to the declanation in the resolution that the contract was invalid by reason of not being submitted to a popular vote: How come that to be stated in there: Did the mass meetings discuss that?

A. No, sir.

Q. How did that get into the resolution?

A. They investigated it from every standpoint.

Q. Who investigated it?

897 A. Different citizens connected with it. Several members of council were favorable to an investigation on account of the defects in the present system; and the people were agitating the question and requesting members of council to take some action on it.

Q. You have not answered my question: How did you get into your resolution—what source did it come from that the city could not make this contract without a popular vote: How come you to put that in your resolution?

A. The first I got of it, I was requested to introduce the resolution; and I asked Mr. John Peabody, who was then alive, to give me his written opinion on the contract.

Q. You got a written opinion as to the validity of the contract?

A. Yes, sir.

Q. Before you introduced that resolution?

A. I wanted to know before anything was done as to how we stood as to the legality of it.

Q. After that you framed that resolution or did you have some one to frame it for you?

A. That resolution was framed by several parties. Not all done by one party. The mass meeting appointed committees to look into the question.

Q. So after you held your mass meetings the resolution that followed was this one in which you repudiated the contract?

A. Yes, that was embodied in the resolution.

Q. What was the date of that mass meeting?

A. I don't remember the date exactly. Mass meetings held
898 on Rose Hill and mass meetings held down town.

Q. Wasn't there a water company formed about that time and chartered, called the Rose Hill Water Company and that really agitated this?

A. No, sir.

Q. Wasn't there another company formed?

A. No, sir; not that I know of.

Q. None chartered?

A. No, sir.

Q. No movement to form one?

A. No, sir; not that I know of.

Q. The mass meetings you speak of, were you present?

A. I wasn't present at all of them. I was at a good many of them.

Q. Wasn't it a sort of a secret gathering of a few favorable to municipal ownership?

A. No, sir.

Q. Were you present at any of the mass meetings?

A. Yes, sir; several.

Q. Who else was present at any of them?

A. Well, members of council, Mr. Kirven—I think, various citizens. I can't re-call them now. I know they were very largely attended. Nothing secret about it at all, nothing closed, they were held publically in a room, and published in the papers.

Q. There were no mass meetings held until you decided this contract was invalid?

A. Yes, sir. Mass meetings held before that that started the movement.

Q. That's what led up to your election in '94?

A. Yes, sir.

Q. In '90, do you remember anything about the quality of the water?

899 A. I don't remember just at that particular year.

Q. '91.

A. No, sir; I do not.

Q. When was the first time, Mr. Rankin, that any of these droughts occurred that you speak of when the water in the reservoir got low?

A. Well, some of them were before the present company got charge.

Q. You mean prior to '91?

A. Yes, sir.

Q. Do you remember any drought prior to '91?

A. Yes, sir—I don't remember the exact year. I know that when Mr. Archer was here, when he was in control there was quite a lot of dissatisfaction then on the part of the citizens as to the quantity and quality of the water; and when Mr. Yocum was here. He was located here for awhile.

Q. You don't remember any occasion, any time, when there was a scarcity of water back of '95?

A. Yes, sir; it has been scarce, more or less, ever since the water works was built.

Q. That's your idea of it?

A. Wouldn't be that way every year. Of course some years were worse than others.

Q. Do you remember anybody's complaining as far back as '90?

A. Yes, there was complaint during Mr. Archer's time. That was before that.

Q. What part of Mr. Archer's time?

A. It was while he and Mr. Yocum were in charge. There was complaint then and the council stopped the pay that was due them.

Q. That was all satisfactorily adjusted, wasn't it?

A. I believe it was.

900 Q. After that was there any more complaint?

A. Yes, complaint more or less all along.

Q. Do you remember any complaint after that: the first matter was adjusted between Archer and council prior to '92 or '93?

A. I don't remember exactly the year. Just know in a general way there has been complaint more or less both as to the quantity of the water and the quality of the water at times pretty much all along.

Q. Why was it you never had any official action taken?

A. I didn't look upon it as my business. I had no personal grievance against the old company nor have I any personal grievance against the present company.

Q. You were very active from the time you became alderman?

A. I was requested to introduce these resolutions on the part of a good many citizens. That is, as I say, I introduced those resolutions.

Q. All of them, didn't you?

A. I don't know that I introduced all of them. I introduced a good many of them.

Q. You were always the most active on that side, were you not?

A. No, sir; I think not. I think there were other alde-men more active than I was. At the same time they asked me to introduce some of them which I did.

Q. During the four years you were alderman, did you yourself alone or council jointly, ever call upon the water works company to remedy any defect?

901 A. I don't remember any official communication that we addressed to them.

Q. Unofficially did you yourself personally?

A. No, sir.

Q. You had your board of health at that time, didn't you?

A. Well, sir, I suppose so. I don't remember just when the board of health was established. Awhile here we didn't have one.

Q. You never had them to investigate the quality or wholesomeness of it?

A. No, sir.

Q. Do you remember when the upper reservoir was built?

A. My recollection is that it was built 3 or 4 years after the lower one. I don't remember the exact year.

Q. What was the purpose of building the upper one?

A. Well, I suppose it was due to the fact that the lower one did not afford a sufficient quantity of water.

Q. Was there any other purpose?

A. I suppose that was the main purpose.

Q. That was a settling reservoir for the mud to settle in so that it would be clear water to go into the lower one?

A. I think that's what the water works people termed it.

Q. There are no thin edges to the lower reservoir?

A. No, sir; I think not.

Q. Never have been?

A. No, sir; that's walled up on the side.

Q. With rock?

A. Yes, sir.

Q. Rock bottom?

A. That's a natural bed of rock.

902 Q. There is no vegetation in the lower reservoir?

A. No, sir.

Q. Never has been?

A. I don't think I have ever seen any growing in there.

Q. How many years did you specify that the upper reservoir was low: You specified '95 and then when was the next?

A. Well, I don't remember the years; but I remember once going over there and saw them have a pump to pump the leakage back into the lower reservoir.

Q. Had a leak in it?

A. Yes, sir; always leaked.

Q. That particular leak was patched up, wasn't it—remedied?

A. I think it leaks yet. Always has leaked.

Q. That bad leak you spoke of this morning, that didn't last long?

A. My knowledge is that it has always leaked more or less. Leaks now.

Q. The pump you spoke of as pumping the water from Stewart Spring into the reservoir, that comes in just below?

A. I think they had the pump located above the spring. Wasn't a very great distance below the lower reservoir.

Q. Do you remember what year that was?

A. No, sir; I don't remember.

Q. Was it since the new company owned it or before?

A. I think it was since this company owned it.

Q. I mean the present company?

A. Yes, sir.

Q. Do you remember any year in which it got low before that?

A. I can't re-call the exact dates; but it has been low.

903 Q. After '95 do you remember any other time it has been low?

A. Yes, it was low in 1902, at the time it failed entirely.

Q. You were alderman you say what years?

A. I was alderman from '92 to '96—four years.

Q. Beginning with '92 or beginning with '93?

A. My recollection is that it was December '92 to December '96.

Q. The mass meetings that you spoke of, wasn't that the result of discussions growing out of certain decisions that the city had the right to repudiate the contract and build its own water works?

A. I think it was before that. I don't know that we knew of any such decision at that time.

Q. You mean you yourself didn't know of it?

A. No, sir; I don't know that I was familiar with any such decision as that.

Q. Was it before or after you became an alderman when you said there were mass meetings held?

A. There were mass meetings held after I was a member of council.

Q. That's, after December '92?

A. Yes, sir.

Redirect examination.

(By Mr. WIMBISH:)

Q. You say that you were mostly in the minority while you were in council but you were not in the minority on this water question: Why wasn't you in the minority on that?

904 A. I think the people generally were very strongly in favor of that. On that question we were in the majority; but on other questions we were decidedly in the minority.

Q. Any practical division in council on this water question?

A. Yes, sir; decidedly.

Q. Any member of council connected with the water company at that time?

A. Mr. Foley was.

Q. Do you mean to say that the dissatisfaction of the people with the water system was based only on the size of the mains and capacity of the reservoir, or was it based——

Objected to as leading.

Q. Was it based on other considerations, if so, what?

A. I don't think the dissatisfaction was due to any size of the mains. The quantity of water—it was due to the insufficient quantity of water for fire purposes and the quality of the water.

Q. These general complaints that you have testified about, were they because the reservoir did not have a capacity of 250,000,000 gallons?

A. No, sir. I don't know what the capacity of the reservoirs were, so far as I am concerned.

Q. Mr. Wimberly asked you if any action was taken to remove Mr. Burrus: I will ask you what part the Board of Control played in the election of the fire chief, if any?

A. They were quite prominent.

Q. What part did council take, ratify or elect?

A. There were several discussions on the question. One time I know the question was up whether we would not make some
905 changes and do away with the volunteer department; and the board of control came up and quite a number of citizens came up and said it would ruin the whole system; that they would resign—all the volunteer department would resign.

The MASTER: Who was the Board of Control?

A. They were the members of the different companies. Some were members of Hook & Ladder and some No. 1——

The MASTER: In the volunteer system?

A. Yes, sir.

Q. They in fact elected the chief?

A. They had a great deal to do with it, and influence was brought to bear on different members of council—I know when this question came up a number of them resigned and got some of the aldermen to change their vote, after they had agreed to make a change.

Q. When did those resignations take place, '96 or '97?

A. It was during the time I was in council. I don't remember the exact year.

Q. When did you first find out the capacity of the reservoir and the sizes of the mains?

A. I didn't know until after the matter had been investigated. After we got Mr. Hall to investigate the matter and make his report.

Q. In these general complaints that you had prior to that time, any manifestation of knowledge of the capacity of the reservoir and the size of the mains?

A. No, sir; I don't know that the citizens generally knew what the sizes of the mains were and what the capacity of the reservoirs was.

Q. What did they complain about?

906 A. Complained about the inefficiency of the system for fire purposes, the quality of the water for drinking purposes and so on, and for domestic use.

(By the MASTER:)

Q. Do you know of your own knowledge the approximate population of the City of Columbus in 1880?

A. No, sir.

907 I. F. PEARCE, sworn by the respondents, testified as follows:

(By Mr. WIMBISH:)

Q. How long have you lived in Columbus?
A. I have been living here I should say 33 years.
Q. Are you connected with the fire department?
—. I am.
Q. How long have you been connected with it?
A. Since I was 14 years old, in '80, when I was torch-bearer; and then I was elected a regular member of No. 1 fire company in '82, volunteer; and I was appointed a paid man in '93.
Q. What position do you hold now?
A. Chief of the Fire department.
Q. When were you elected?
A. I was elected for the year 1901 as chief; and then for the year 1903 and 1904.
Q. Did you hold any position before that time?
A. Yes, sir; I was assistant chief in '98 and in '97; and then in 1902. I was foreman of the volunteer companies in '88 and '89, of No. 1 company.
Q. When was the paid department established here?
A. I think the semi-paid was about '88.
Q. Is it a full paid now or semi-paid?
A. We called it a full paid in '98. What I mean by semi-paid, there were some paid men put on at that time; but the volunteers were not discontinued until in '98.
Q. Are you familiar with the quality of the water that has been supplied to the City of Columbus through the mains by the Columbus Water Works Company?
908 A. I am.
Q. Well, what has been the quality of the water prior to the establishment of the filtration plant?
A. Bad.
Q. When did you first observe the quality of the water?
A. Well, at different times—seasons of the years from way back soon after the system was built.
Q. How was the quality prior to '90?
A. In '90 it was bad.
Q. To what extent was it bad—what part of the year?
A. Well, it was muddy at times and at times it had an offensive odor to it.
Q. What seasons of the year?
A. Generally I should say in the Fall. Whenever the water would get low in the reservoir.
Q. How has it been since '90?
A. It has been bad since '90.
Q. Has it been bad more frequently since then than it was before '90?
A. At times it was.
Q. Do you remember '95?

A. No, sir.

Q. A little hydrant three quarters of an inch never would throw a large stream, would it?

A. No, sir; I don't suppose it would.

Q. Water splits up in the air where streams are that small?

A. Ought to throw water 25 or 30 feet high, I imagine.

Q. Did you ever see any used at a fire at all?

A. I suppose they have been used.

Q. I mean you yourself ever seen them?

A. No, sir.

Q. Q. From your own knowledge of the subject you are not prepared to say that a hydrant like that would throw a stream even as much as 20 or 25 feet?

A. I have seen them throw further than that. We have one.

Q. You mean vertical height?

A. Yes, sir.

Q. Were there any fire engines used at that same fire?

A. Yes, sir.

Q. How many?

A. Started I think with two; but when the girls school caught afire they ordered out the next one.

Q. Were those engines attached to the same pipe that this little hydrant led out from?

A. I don't know, sir. They were attached to city hydrants located at different points.

Q. On the same line of pipe?

A. I suppose they were.

Q. Do you know what size pipe it was?

A. No, sir.

Q. You know that 2 or 3 engines under steam pressure,
881 drawing water out, wouldn't leave any water to go to a little hydrant in a yard, would it?

A. I am not sure whether it would or not. Depends upon the quantity of water in the pipe. Of course if there was a larger pipe it would supply the engine and still would leave water for smaller hose too.

Q. The only stream at that fire that you noticed didn't have pressure was that little yard hydrant, is that right?

A. That was brought more particularly to my attention just at that time.

Q. Did you notice any more during that fire?

A. I noticed at these houses right across the street from the fire had great difficulty in getting water to keep the roofs wet. In fact I was up on the roof of Mr. Edwards' house, the one he was living in, and we had great difficulty in getting water to put the fire out. At times had 3 or 4 of them.

Q. How did you try to get water, from the fire engines?

A. No, sir; had buckets.

Q. It is a fact, isn't it, that when 2 or 3 engines are drawing water under steam pressure out of a small pipe, it leaves very little pressure outside?

A. Yes, sir; greatly reduces the pressure.

Q. There were three engines working at that time?

A. I don't remember whether they were working just at that time or not. Probably 2 of them were at work and the other one was called in.

Q. You said there were three?

A. Three on the fires. At this particular time the third engine was not called out, according to my recollection, until the
882 girls public school caught on fire.

Q. You are unable to say that there was any defect in pressure before the engines began to exhaust the pressure by the use of the water? themselves at that fire?

A. I suppose if they had used that yard hydrant before the engines were there it would have afforded water.

Q. You saw nothing to indicate to the contrary?

A. No, sir.

Q. Did you see any defect of pressure before the engine drew the water out?

A. No, sir.

Q. That's the only fire you specified in your direct examination back of 1902: Roe Edwards, you didn't give the date of that?

A. That was the same fire. Roe Edwards lived just across the street from the 5th Avenue fire.

Q. There was one other fire, the mattress factory, that you described?

A. Yes, sir.

Q. What was the date of the mattress factory fire?

A. I think that was in 1902, my recollection of it.

Q. What was the size of the mattress factory that burned up?

A. It was a small factory.

Q. About how big: it was not as big as the Eagle & Phenix, was it?

A. No, sir; a small factory in the rear of the yard.

Q. What size building was it, as big as the court house?

A. O, no, sir; a small building.

Q. Just give in feet about the dimensions?

A. I don't suppose the building was ever 30 or 40 feet long. Small building.

883 Q. How many stories high?

A. One story.

Q. Frame or brick?

A. Frame.

Q. What was its contents?

A. Its contents, I suppose was such as they make mattresses out of.

Q. What do they make mattresses out of, cotton and feathers?

A. Yes, sir.

Q. Rather inflammable, was it not?

A. Yes, sir.

Q. A small building like that filled with inflammable material would burn up before you could get in much work on it?

A. Yes, sir; it would burn rapidly.

Q. That was one fire at which the mattress factory burned up?
A. Yes, sir.
Q. Did anything else burn up except that little mattress factory?
A. Burned the roof off the residence.
Q. They were able to stop the fire on the residence after the roof burned?
A. Yes, sir; pretty well. The upper part of the house was burned off.
Q. Frame building?
A. Yes, sir.
Q. Were the walls covered with anything?
A. You mean the outside walls?
Q. Yes?
A. Weatherboarding.
Q. Wasn't it covered with some kind of iron or tin?
A. Not that I remember, just a frame house.
Q. How about the roof, a shingle roof?
A. Shingle roof, yes.
Q. They stopped that fire after it got under good headway?
A. Yes, sir; the mattress factory was burned and the roof was burned off the house.
Q. Did they use the engine at that fire?
884 A. Had one engine located on 6th Avenue playing on the mattress factory and had another one on 5th Avenue playing on the house. Think probably two on the mattress factory at one time but I am not sure about that.
Q. You spoke of the mattress factory burning up, were they not playing their water as high as the top of the factory?
A. Think they were, yes.
Q. No lack of water pressure made that mattress factory burn up?
A. No, sir; I suppose that would have burned any way. I believe though that they could have saved the roof of the residence had the system been able to have given a good supply of water.
Q. You say they were playing on the residence: you get that by what they told you?
A. No, I was standing right there looking at the engine pumping water and there was no water coming from it.
Q. Both of those engines were on the same line of pipe?
A. I don't know about that. One was on 5th Avenue and the other on 6th is my recollection.
Q. How far was the closest hydrant to this house that the top was burned off?
A. Probably 150 feet. Something like that. Right close to the house.
Q. I believe it was at the Columbus Iron Works fire where you saw some women with barrels of water: What streams of water did you see at that fire?
A. I think there were at least two engines at work on that.
Q. Wasn't there more than two?
A. Possibly so.
Q. Any other streams playing on that except the two engines?

A. I think not.

885 Q. The engines threw good streams of water, didn't they?

A. I was at these houses most of the time trying to keep them from catching. If they had caught there was some valuable property in the rear of them.

Q. Any streams playing on the houses?

A. No, sir; the citizens took charge of them.

Q. Took charge of that with buckets?

A. Yes, sir.

Q. The buckets threw water all right?

A. Yes, sir; the buckets did very good work. Saved the houses, in my opinion.

Q. That's all you had working on those houses where you had buckets: you didn't have any fire engine or hose?

A. No, sir.

Q. There was no defect of pressure that caused any harm that you saw at that time?

A. It was a difficult matter to get water on the roofs of the houses.

Q. What did you draw your water out of?

A. Had some barrels filled up with water and dipped it up in buckets.

Q. You say it was difficult to get it: why was it difficult to get it?

A. Small hydrants wouldn't throw the water.

Q. Small hydrants: they were these small hydrants like you have in the yard?

A. Yes, sir.

Q. Do you know whether they were new or old?

A. No sir.

Q. Or whether they had rusted out?

A. No, sir.

Q. You never — any examination to see?

A. No, sir.

Q. Do you know whether they were connected with the Columbus Iron Works' standpipe or the water works?

886 A. I do not.

Q. You don't know which system they were connected with?

A. They must have been connected with the city. The Iron Works is not in the business of furnishing water.

Q. They have a standpipe there?

A. I don't remember their having it. They might have had it.

Q. Right across the street from this place?

A. Just across the street.

Q. The only thing that you spoke of there in the way of pressure were these little fixtures, ¾ of an inch or one inch?

A. Yes, sir.

Q. You know it is a fact in any sort of a system, when you couple on to fire plugs between the source of supply and the little streams running in the yards, it cuts off the pressure in the yard for the time being?

A. It does to a great extent, reduces the pressure: but I see no

reason why it should stop the flow of the water entirely if the pressure is sufficient to afford the engines with water and still leave water enough——

Q. It would depend upon the number of streams and quantity they were drawing out and as to the number and size of pipes?

A. A greater number of streams would reduce the pressure that much.

Q. Of course an engine with its steam power would get its water first and then these others would only get the leavings?

A. Naturally the water would flow to the suction.

887 Q. The force of the suction would pull the water from the little hydrants?

A. Yes, to some extent.

Q. By causing a vacuum between?

A. Yes, sir.

Q. So *so* far as you speaking of the pressure failing was the little yard faucet there—these small, little yard faucets: Those are the only fires you mentioned in your direct examination, where you had noticed any defect of pressure: You have seen quite a number of fires in the twenty years you have been in Columbus?

A. Lots of them.

Q. In addition to those you have specified where you saw little yard hydrants that did not seem to give much water while the steamers were running, you have seen a great many other fires?

A. Yes, sir; and I have seen a great many of them where the hose was attached to the mains without the use of the engine and they could not reach the roof of a one-story house.

Q. Can you mention any one of that sort?

A. I don't re-call just now any particular instance, no further than the Watt fire.

Q. Which fire was that?

A. At the Watt house across the street from us; and then another fire at the Huff place right across the street from where we live.

Q. Can you mention any more?

A. A good many others. I can't recall them exactly. I have seen them frequently put the hose on ladders and carry the hose right up to the fire for the lack of pressure. It has been done often.

Q. Why was it in specifying defects this morning you only

888 mentioned these others?

A. Those were more prominent fires that occurred to me. I have seen numerous fires—in fact it was a universal custom almost for the fireman to carry their hose right up to the fire on ladders.

Q. Don't they do that everywhere; and ain't that a good way to fight fires?

A. If they had sufficient pressure they could, after the fire catches on the roof, they could stand on the ground.

Q. Ain't it a fact that the closer you get to the house the more force you have with your stream, with the same size nozzle you can always throw it with more force where the nozzle is closer to the blaze?

A. Yes, sir.

Q. Whatever the amount of pressure may be, as good firemen who do their work rightly, will carry their nozzle as close to the fire as they can get it?

A. Yes, but there is a great loss of time in doing that, if they could reach it from the sidewalk it would be better.

Q. Don't you know that every fire you have seen in Columbus, and everywhere else, that is the way they do, that they carry the nozzle up where they can play closely on the fire?

A. I don't know that they do it in other places, where they carry it up on ladders to get to the fire.

Q. Did you ever see them fight fires at other places?

A. Yes, sir.

Q. Don't they have a hook and ladder company for that
889 purpose?

A. Yes, sir.

Q. Isn't it a fact that every fire department has a hook and ladder company for that purpose?

A. I don't know that they are for that purpose.

Q. Don't you know from your experience as a fireman——

A. I say if they could reach the fire from the sidewalk, they could put it out before they could get ladders to put it out. Frequently the hook and ladder part of the department is behind time. Don't get there promptly; and it has been the custom*er* of the firemen here pretty much altogether, even on one story houses, frequently they will carry the hose up on a ladder to reach the fire on a one story house. They do that frequently. I saw that on a two story house here where Mr. Barlow lived about two months ago, they carried the hose up on ladders. If they had sufficient pressure to reach the fire in its incipiency they could save lots of time.

Q. Isn't it a fact that the closer you can get the nozzle to the fire, the more better you can direct it, that is, to the very point where it is ablaze; and in that way get the best effect of the stream?

A. I don't believe that is a fact at times. I believe if they were not quite as close, if the fire was on the roof, it would give the water a chance to spread over more space, that is, in its incipiency and they could put it out better from the sidewalk, if they had the pressure promptly, than by dragging the hose up there; but generally
890 speaking your proposition is correct.

Q. You speak of incipiency: as a matter of fact fires generally get under headway before you get to it, does it not?

A. Generally gains some headway, yes.

Q. You judge that they do that from the lack of pressure and not because it is the method of doing it: Do you remember any fire at which you have seen them throw a stream from the ground where it did not rise high enough?

A. I have seen them try frequently and fail.

Q. Can you mention any fire where you have seen them do that and could not reach it?

A. Yes, at this Huff fire.

Q. Mention another?

A. I don't remember just now. If I could remember the fires I could tell. I don't re-call just now the various fires.

Q. You were an alderman?

A. Four years.

Q. The fire chief makes his annual reports as to pressure?

A. Yes, sir.

Q. The fire department are better in a position to know, are they not, when the pressure is satisfactory and when it is not?

A. Yes, sir.

Q. You have seen, as member of council, when they made these reports—annual reports?

A. I saw it during the years I was a member of council.

Q. You never questioned the correctness of those reports, did you?

A. Well, I thought the reports were a little biased. The
891 chief of the fire department at that time was Mr. George Burrus.

Q. Which time?

A. During the time I was a member of council. They were made by Mr. George Burrus, who was clerking in Mr. Foley's store; and Mr. Foley was connected with the water works company—interested.

Q. You never made any change in your fire chief?

A. No, sir; we were in the minority in council most of the time.

Q. You were not in the minority when you got through this resolution of 1894?

A. No, sir.

Q. You were not in the minority when you got through these resolutions in 1895?

A. No, sir.

Q. You were not in the minority in 1893 when you got Mr. Hall down here to make these surveys?

A. No, sir.

Q. What years were you in the minority: You were not there but four years?

A. No, sir.

Q. What year was it you were in the minority?

A. I am speaking of the people that favored a new system of water works. Generally they were in the minority.

Q. You got through your resolutions in '95 without any trouble?

A. Yes, sir.

Q. You got your resolution through in '94 by a big majority?

A. Yes, sir. Went through with a majority.

Q. You got Mr. Hall down here with a majority?

A. Yes, sir.

Q. Do you remember a vote in which you ever went into in this water works matter that you were in the minority in those
892 four years?

A. I don't refer particularly altogether to the time I was a member of council only.

Q. I am asking you——

A. (Interrupting.) That's true.

Q. During the time you were a member of council—I am asking you about Mr. Burrus: You never found any fault with Mr. Burrus and tried to re-place him with anybody else, did you?

A. No, sir; we didn't feel like we could do it.

Q. You mean to say you didn't think Mr. Burrus made truthful reports to council?

A. No, I won't put it that way. I say Mr. Burrus' reports before the time the present water works company got possession of the water works were very different from Mr. Burrus' reports after they did get possession.

Q. I will let you refresh your recollections about the reports and see if you are not mistaken about that: Isn't it a fact that the reports were about the same the whole time: Have you examined these reports to see?

A. I refer to the reports of Mr. Burrus in which he condemned the four inch mains.

Q. What report do you refer to in which he condemned the four inch mains: What date was that?

A. That was before the present company got control. I don't remember the exact year.

Q. That was way back of '91?

A. Yes, sir; I think it was. I don't remember the exact year.

Q. What year?

A. I think probably about '86. I know Mr. Jordan con-
893 demned the four inch mains and his report will bear me out in that. Mr. Burrus also made a report where he said the building of this standpipe didn't add to the pressure.

Q. What year was that?

A. That was before the present company got in charge. His report will bear me out in that.

Q. What year: You mean before '91?

A. Yes, sir.

Q. The reports will speak for themselves?

A. They were printed in pamphlet form.

Q. You are giving your recollection of those reports?

A. Yes, sir.

Q. Mr. Rankin, when you speak of Mr. Burrus being prejudiced, don't you mean that he was not as bitter against the water works company as you were; that you took the lead and went further?

A. I didn't say that Mr. Burrus was prejudiced. I said the tenor of his reports before the present company got possession of the water works was different from the tone of his reports after they got possession.

Q. Mr. Pierce, you don't mean to say that his reports were untruthful?

A. I don't know that I examined any of Mr. Pierce's reports. I don't know what his reports were.

Q. The fire chiefs are in a better position to judge as to the sufficiency of the pressure than you are?

A. Yes, sir.

Q. You never at any time when you were in council ever questioned the correctness of any of the reports?

A. I don't know that I ever took any action.

Q. They were accepted as truthful and correct and coun-
894 cil acted on them?

A. Yes, sir.

Q. You spoke of complaints: How were those complaints made?

A. It was complaint generally among the citizens.

Q. Complained to one another or complained to anybody?

A. Well, there was a pretty general complaint on the part of the people.

Q. What do you mean by complaint—complaint to who?

A. I heard these complaints or discussions—town talk.

Q. To get at something definite: They ever complain to council?

A. I suppose they have done that.

Q. Do you know of any complaint to council by the citizens?

A. Well, complaints was the reason why these ordinances were introduced.

Q. I will ask you this question: did you, yourself, in '90 hear of any of these complaints or know of any by the citizens to council?

A. Well, I know that there were complaints but I don't remember now that they came particularly to me.

Q. In '90?

A. I don't remember whether it was that particular year or not. More or less complaints ever since the system has been built. Before the present company got charge and since that time.

Q. You mean there has always been some sentiment here for municipal ownership?

A. No, I don't mean that.

Q. You mean before the contract was made in '81 the town
895 was divided as to whether to contract with another or build for themselves?

A. I don't know. I don't remember any movement on the part of the people advocating the city's owning its own works.

Q. You don't know that that was one of the complaints before they entered into the contract or not?

A. No, sir; I don't remember that. May have been such a movement but I don't remember it.

Q. You never yourself in '90 had council to take any action in the matter, did you?

A. No, sir.

Q. You never tried to get council to take any action, did you? You don't know of anybody that tried to get council to take any action, in '90?

A. I can't re-call any one.

Q. In '91 did you try to get council to take any action?

A. I don't remember any.

Q. Do you know anybody that tried to get anybody to take any action?

A. No, sir.

Q. Or in '92?

A. No, sir; I don't remember.

Q. When these resolutions were prepared in '94 and '95, in which you stated the city had no authority to make this contract without submitting it to a popular vote: Did you prepare those resolutions?

A. No, sir; I did not.

Q. Who prepared them?

Objected to as immaterial.

The MASTER: You can ask him if they were based upon any formal complaint lodged with that body.

Q. Where did you get the information that the contract was not good unless submitted to a popular vote?

896 Objected to as immaterial.

The MASTER: You can ask if any formal movement was taken.

Q. This resolution of 1894 about not being submitted to a popular vote, when was the matter that led to that resolution first brought about?

A. The first that came to my attention was that the people were holding mass meetings to investigate this question; and being a member of council——

Q. (Interrupting.) To investigate the question of municipal ownership?

A. No, sir; to investigate the question of defects in the present system and to remedy them.

Q. When was it you had the mass meeting?

A. I think it was in '93 or '92—I mean '92 or '93.

Q. Where was any mass meeting held?

A. Had several of them on Rose Hill, at Newman's Pavilion and had some down town here. Some I attended and some I did not.

Q. The Rose Hill people didn't have any water at that time?

A. No, sir; the movement started down town as well as up there.

Q. What led to the declaration in the resolution that the contract was invalid by reason of not being submitted to a popular vote: How come that to be stated in there: Did the mass meetings discuss that?

A. No, sir.

Q. How did that get into the resolution?

A. They investigated it from every standpoint.

Q. Who investigated it?

897 A. Different citizens connected with it. Several members of council were favorable to an investigation on account of the defects in the present system; and the people were agitating the question and requesting members of council to take some action on it.

Q. You have not answered my question: How did you get into your resolution—what source did it come from that the city could not make this contract without a popular vote: How come you to put that in your resolution?

A. The first I got of it, I was requested to introduce the resolution; and I asked Mr. John Peabody, who was then alive, to give me his written opinion on the contract.

Q. You got a written opinion as to the validity of the contract?

A. Yes, sir.

Q. Before you introduced that resolution?

A. I wanted to know before anything was done as to how we stood as to the legality of it.

Q. After that you framed that resolution or did you have some one to frame it for you?

A. That resolution was framed by several parties. Not all done by one party. The mass meeting appointed committees to look into the question.

Q. So after you held your mass meetings the resolution that followed was this one in which you repudiated the contract?

A. Yes, that was embodied in the resolution.

Q. What was the date of that mass meeting?

A. I don't remember the date exactly. Mass meetings held
898 on Rose Hill and mass meetings held down town.

Q. Wasn't there a water company formed about that time and chartered, called the Rose Hill Water Company and that really agitated this?

A. No, sir.

Q. Wasn't there another company formed?

A. No, sir; not that I know of.

Q. None chartered?

A. No, sir.

Q. No movement to form one?

A. No, sir; not that I know of.

Q. The mass meetings you speak of, were you present?

A. I wasn't present at all of them. I was at a good many of them.

Q. Wasn't it a sort of a secret gathering of a few favorable to municipal ownership?

A. No, sir.

Q. Were you present at any of the mass meetings?

A. Yes, sir; several.

Q. Who else was present at any of them?

A. Well, members of council, Mr. Kirven—I think, various citizens. I can't re-call them now. I know they were very largely attended. Nothing secret about it at all, nothing closed, they were held publicly in a room, and published in the papers.

Q. There were no mass meetings held until you decided this contract was invalid?

A. Yes, sir. Mass meetings held before that that started the movement.

Q. That's what led up to your election in '94?

A. Yes, sir.

Q. In '90, do you remember anything about the quality of the water?

899 A. I don't remember just at that particular year.

Q. '91.

A. No, sir; I do not.

Q. When was the first time, Mr. Rankin, that any of these droughts occurred that you speak of when the water in the reservoir got low?

A. Well, some of them were before the present company got charge.

Q. You mean prior to '91?

A. Yes, sir.

Q. Do you remember any drought prior to '91?

A. Yes, sir—I don't remember the exact year. I know that when Mr. Archer was here, when he was in control there was quite a lot of dissatisfaction then on the part of the citizens as to the quantity and quality of the water; and when Mr. Yocum was here. He was located here for awhile.

Q. You don't remember any occasion, any time, when there was a scarcity of water back of '95?

A. Yes, sir; it has been scarce, more or less, ever since the water works was built.

Q. That's your idea of it?

A. Wouldn't be that way every year. Of course some years were worse than others.

Q. Do you remember anybody's complaining as far back as '90?

A. Yes, there was complaint during Mr. Archer's time. That was before that.

Q. What part of Mr. Archer's time?

A. It was while he and Mr. Yocum were in charge. There was complaint then and the council stopped the pay that was due them.

Q. That was all satisfactorily adjusted, wasn't it?

A. I believe it was.

900 Q. After that was there any more complaint?

A. Yes, complaint more or less all along.

Q. Do you remember any complaint after that: the first matter was adjusted between Archer and council prior to '92 or '93?

A. I don't remember exactly the year. Just know in a general way there has been complaint more or less both as to the quantity of the water and the quality of the water at times pretty much all along.

Q. Why was it you never had any official action taken?

A. I didn't look upon it as my business. I had no personal grievance against the old company nor have I any personal grievance against the present company.

Q. You were very active from the time you became alderman?

A. I was requested to introduce these resolutions on the part of a good many citizens. That is, as I say, I introduced those resolutions.

Q. All of them, didn't you?

A. I don't know that I introduced all of them. I introduced a good many of them.

Q. You were always the most active on that side, were you not?

A. No, sir; I think not. I think there were other alde-men more active than I was. At the same time they asked me to introduce some of them which I did.

Q. During the four years you were alderman, did you yourself alone or council jointly, ever call upon the water works company to remedy any defect?

901 A. I don't remember any official communication that we addressed to them.

Q. Unofficially did you yourself personally?

A. No, sir.

Q. You had your board of health at that time, didn't you?

A. Well, sir, I suppose so. I don't remember just when the board of health was established. Awhile here we didn't have one.

Q. You never had them to investigate the quality or wholesomeness of it?

A. No, sir.

Q. Do you remember when the upper reservoir was built?

A. My recollection is that it was built 3 or 4 years after the lower one. I don't remember the exact year.

Q. What was the purpose of building the upper one?

A. Well, I suppose it was due to the fact that the lower one did not afford a sufficient quantity of water.

Q. Was there any other purpose?

A. I suppose that was the main purpose.

Q. That was a settling reservoir for the mud to settle in so that it would be clear water to go into the lower one?

A. I think that's what the water works people termed it.

Q. There are no thin edges to the lower reservoir?

A. No, sir; I think not.

Q. Never have been?

A. No, sir; that's walled up on the side.

Q. With rock?

A. Yes, sir.

Q. Rock bottom?

A. That's a natural bed of rock.

902 Q. There is no vegetation in the lower reservoir?

A. No, sir.

Q. Never has been?

A. I don't think I have ever seen any growing in there.

Q. How many years did you specify that the upper reservoir was low: You specified '95 and then when was the next?

A. Well, I don't remember the years; but I remember once going over there and saw them have a pump to pump the leakage back into the lower reservoir.

Q. Had a leak in it?

A. Yes, sir; always leaked.

Q. That particular leak was patched up, wasn't it—remedied?

A. I think it leaks yet. Always has leaked.

Q. That bad leak you spoke of this morning, that didn't last long?

A. My knowledge is that it has always leaked more or less. Leaks now.

Q. The pump you spoke of as pumping the water from Stewart Spring into the reservoir, that comes in just below?

A. I think they had the pump located above the spring. Wasn't a very great distance below the lower reservoir.

Q. Do you remember what year that was?

A. No, sir; I don't remember.

Q. Was it since the new company owned it or before?

A. I think it was since this company owned it.

Q. I mean the present company?

A. Yes, sir.

Q. Do you remember any year in which it got low before that?

A. I can't re-call the exact dates; but it has been low.

903 Q. After '95 do you remember any other time it has been low?

A. Yes, it was low in 1902, at the time it failed entirely.

Q. You were alderman you say what years?

A. I was alderman from '92 to '96—four years.

Q. Beginning with '92 or beginning with '93?

A. My recollection is that it was December '92 to December '96.

Q. The mass meetings that you spoke of, wasn't that the result of discussions growing out of certain decisions that the city had the right to repudiate the contract and build its own water works?

A. I think it was before that. I don't know that we knew of any such decision at that time.

Q. You mean you yourself didn't know of it?

A. No, sir; I don't know that I was familiar with any such decision as that.

Q. Was it before or after you became an alderman when you said there were mass meetings held?

A. There were mass meetings held after I was a member of council.

Q. That's, after December '92?

A. Yes, sir.

Redirect examination.

(By Mr. WIMBISH:)

Q. You say that you were mostly in the minority while you were in council but you were not in the minority on this water question: Why wasn't you in the minority on that?

904 A. I think the people generally were very strongly in favor of that. On that question we were in the majority; but on other questions we were decidedly in the minority.

Q. Any practical division in council on this water question?

A. Yes, sir; decidedly.

Q. Any member of council connected with the water company at that time?

A. Mr. Foley was.

Q. Do you mean to say that the dissatisfaction of the people with the water system was based only on the size of the mains and capacity of the reservoir, or was it based——

Objected to as leading.

Q. Was it based on other considerations, if so, what?

A. I don't think the dissatisfaction was due to any size of the mains. The quantity of water—it was due to the insufficient quantity of water for fire purposes and the quality of the water.

Q. These general complaints that you have testified about, were they because the reservoir did not have a capacity of 250,000,000 gallons?

A. No, sir. I don't know what the capacity of the reservoirs were, so far as I am concerned.

Q. Mr. Wimberly asked you if any action was taken to remove Mr. Burrus: I will ask you what part the Board of Control played in the election of the fire chief, if any?

A. They were quite prominent.

Q. What part did council take, ratify or elect?

A. There were several discussions on the question. One time I know the question was up whether we would not make some
905 changes and do away with the volunteer department; and the board of control came up and quite a number of citizens came up and said it would ruin the whole system; that they would resign—all the volunteer department would resign.

The MASTER: Who was the Board of Control?

A. They were the members of the different companies. Some were members of Hook & Ladder and some No. 1——

The MASTER: In the volunteer system?

A. Yes, sir.

Q. They in fact elected the chief?

A. They had a great deal to do with it, and influence was brought to bear on different members of council—I know when this question came up a number of them resigned and got some of the aldermen to change their vote, after they had agreed to make a change.

Q. When did those resignations take place, '96 or '97?

A. It was during the time I was in council. I don't remember the exact year.

Q. When did you first find out the capacity of the reservoir and the sizes of the mains?

A. I didn't know until after the matter had been investigated. After we got Mr. Hall to investigate the matter and make his report.

Q. In these general complaints that you had prior to that time, any manifestation of knowledge of the capacity of the reservoir and the size of the mains?

A. No, sir; I don't know that the citizens generally knew what the sizes of the mains were and what the capacity of the reservoirs was.

Q. What did they complain about?

906 A. Complained about the inefficiency of the system for fire purposes, the quality of the water for drinking purposes and so on, and for domestic use.

(By the MASTER:)

Q. Do you know of your own knowledge the approximate population of the City of Columbus in 1880?

A. No, sir.

907 I. F. PEARCE, sworn by the respondents, testified as follows:

(By Mr. WIMBISH:)

Q. How long have you lived in Columbus?
A. I have been living here I should say 33 years.
Q. Are you connected with the fire department?
—. I am.
Q. How long have you been connected with it?
A. Since I was 14 years old, in '80, when I was torch-bearer; and then I was elected a regular member of No. 1 fire company in '82, volunteer; and I was appointed a paid man in '93.
Q. What position do you hold now?
A. Chief of the Fire department.
Q. When were you elected?
A. I was elected for the year 1901 as chief; and then for the year 1903 and 1904.
Q. Did you hold any position before that time?
A. Yes, sir; I was assistant chief in '98 and in '97; and then in 1902. I was foreman of the volunteer companies in '88 and '89, of No. 1 company.
Q. When was the paid department established here?
A. I think the semi-paid was about '88.
Q. Is it a full paid now or semi-paid?
A. We called it a full paid in '98. What I mean by semi-paid, there were some paid men put on at that time; but the volunteers were not discontinued until in '98.
Q. Are you familiar with the quality of the water that has been supplied to the City of Columbus through the mains by the Columbus Water Works Company?
908 A. I am.
Q. Well, what has been the quality of the water prior to the establishment of the filtration plant?
A. Bad.
Q. When did you first observe the quality of the water?
A. Well, at different times—seasons of the years from way back soon after the system was built.
Q. How was the quality prior to '90?
A. In '90 it was bad.
Q. To what extent was it bad—what part of the year?
A. Well, it was muddy at times and at times it had an offensive odor to it.
Q. What seasons of the year?
A. Generally I should say in the Fall. Whenever the water would get low in the reservoir.
Q. How has it been since '90?
A. It has been bad since '90.
Q. Has it been bad more frequently since then than it was before '90?
A. At times it was.
Q. Do you remember '95?

A. Yes, in '95 the water was bad, more so than usual.
Q. Did you see the reservoirs at that time?
A. I did.
Q. What were there condition?
A. There was very little water in the upper reservoir. Scarcely any, just a little stream running through the center of the upper pond.
Q. What was the condition of the reservoir as to decayed vegetable matter, etc.?
909 A. It was mud, where the water would recede, why it would leave it muddy—black mud.
Q. Did you examine the quality of the water in the lower reservoir?
A. Just made a casual observation. Didn't drink any of it. I noticed the depth of the water but didn't notice the quality of it.
Q. Did you notice the odor of it—did you notice the smell or odor?
A. In '95 I don't remember that I did, at the time I was out there.
Q. Do you remember any other seasons of drought that especially impresses themselves on your mind?
A. Yes, sir; I think it was in '98 at the time it went dry, in 1902.
Q. What were the conditions you found in '98?
A. Well, the condition in '98 was worse than it was the first time I went out there in '95.
Q. You mean the water was lower?
A. Yes, sir; the water was lower in the lower reservoir and wasn't none in the upper reservoir.
Q. What was the quality of the water at that time?
A. It was bad.
Q. How is the water conveyed from the reservoirs to the city?
A. Through a 12 inch pipe by gravity pressure.
Q. I will ask you, from your experience as a fireman, if that 12 inch pipe is sufficient to convey an adequate supply of water to this city for domestic and fire purposes?
A. I don't think it is large enough.
Q. Why don't you think so?
910 A. It is from observation at fires. Before the Rose Hill standpipe was put up, whenever we would have a fire and draw on the mains, the water could not get here fast enough and wouldn't have any pressure.
Q. How about the size of the mains in the city distribution system?
A. Well, there are different sizes. There are four different sizes on Broad Street. Starts at the engine house at 12 inches and runs down to six.
Q. As a whole are they sufficient to supply the necessary fire protection?
A. No, sir; not the four inch mains.
Q. How many fire streams of water can you get from a four inch main?

A. It is according to the condition of the building and the location of the main and whether it is a dead end or not and its proximity to the large main on Broad Street.

Q. Not speaking about the amount of pressure so much as the number of fire streams you can get from a four inch main—I mean effective fire streams?

A. Can't get over two streams for a steamer from a four inch, two one inch streams. If I connect another steamer on the corner of a four inch main, we won't get a sufficient amount of water.

Q. How about a six inch main?

A. Tied in, not a dead end, I can get water for two steamers.

Q. How many streams will that be?

A. Be four.

Q. Are there many dead ends in this system?

A. Yes, sir; there are several.

Q. Have any filter out there at their plant?

A. Didn't see any. Don't think they did. If there had been one there I would have seen it or known it.

911 Q. What was the effect of a lack of filtering the water in the mains with reference to bringing in mud, leaves, etc.?

A. On more than one occasion—we have a strainer on the suction of our engine, we had to stop at one fire that I can call to mind, and get the leaves and sticks out of the strainer of the engine.

Q. Were did they come from?

A. Came out of the mains and reservoir.

Q. What's the effect of trash and leaves in the mains?

A. Cuts off the source of supply to the steamer. If we get a sufficient quantity of them in there, we have to shut down and take them out.

Q. What pressure is sufficient to effectively fight fire, fires of any magnitude, in this city?

A. Well, with sufficient size mains, an ordinary fire, I should say 60 to 80 pounds.

Q. Take the mains as they exist in this system, on an average, take the system as it is constructed with its dead ends, take a fire that is a larger fire than ordinary, how much pressure would be necessary for effective service?

A. Well, that would depend upon the number of openings and the number of hydrants you had in service.

Q. Take the fire like the Iron Works fire here?

A. Well, at the Iron Works fire ought to have had at least 8 inch mains to the plugs.

Q. What pressure would have been necessary?

A. Ought to have had at least 60 pounds.

Q. What pressure did you have at that fire, do you re-
912 member?

A. The records will show that.

Q. Have you the records? Are you willing to testify as to those?

A. Yes, sir. I have the records. I can state on account of one of the steamers—about the pressure, we had a reserve engine placed on the main at 8th and Front Street and we couldn't get over 40

pounds pressure from there; and we had to move it to Broad Street to get on an eight inch main, on 8th and Broad, because we could not get sufficient pressure from that plug.

Q. What do you mean by 40 pounds pressure?

A. That was all the pressure that engine could get out of that main.

Q. With the suction of the engine added to it?

A. Yes, sir. When you tried to get pressure over 40 pounds, the engine would run away with itself.

Q. That the pressure at that point if the engine had not been used?

A. The pressure over 40 pounds would run away with itself.

Q. What was the pressure without the use of the engine?

A. If the engine hadn't been on the hydrant?

Q. Yes?

A. I don't know exactly. I don't suppose it would have been over 15 pounds, something like that.

Q. How far do your records extend back?

A. We have them from the beginning of the gauge at No. 5; but some of them have been misplaced. We have got them back now as far as '98.

Q. You have not got them back of that?

A. No, sir; they were placed in the court house somewhere and I have never been able to get hold of them.

913 Q. Do you remember the fire of January 3, 1893, Mrs. Preer's residence?

A. Yes, sir.

Q. Please state what the conditions were then and there as to the supply of water and the pressure?

A. I went up with the reel and attached to the hydrant there at the corner 15th Street and Broad and laid a line and give the signal to turn on the water and it wouldn't go over 3 or 4 feet from the nozzle at the back part of the house—outhouse or kitchen.

Q. What was the cause of the failure of the water to come through the nozzle at a greater force?

A. I could not find out. I don't know what the trouble was. Attached the steamer and tried to draw it with the steamer and we eventually had to move the steamer down to 14th and Broad.

Q. That on the same line?

A. No, sir; 14th was on a different main.

Q. Did you get any water on that occasion from the main that supplied the hydrant at 15th Street and Broad?

A. No, sir; we abandoned that hydrant.

Q. Did you abandon that main?

A. Yes, sir. That's my recollection. I don't think it is tied in down below there; but I won't be sure on that point.

Q. The fire up on 5th Avenue, when the Girls' Public Schools burned, October 30, 1895, please state what the conditions were then?

A. I was at the engine house and went out on the reel and put on the pipe myself and give the signal for the water. The corner house

was on fire and there was a very small blaze on the roof and
914 the water would not go up to the top of the roof. By the time we got the engine started 2 or 3 houses were on fire.

Q. What was the pressure at that time?

A. I don't recollect that.

Q. I understand you have no record back of that fire?

A. That was in '95: I don't think I have got the record that far back.

Q. From your experience, judging from the flow of the water, what would you say was the pressure at that time?

A. We had a lot of hose out, 600 feet of hose: You mean at the hydrant or at the nozzle?

Q. Either or both?

A. I don't think the water would go as high as the roof of this house: be not over 15 or 20 pounds, I suppose, at the nozzle.

Q. That at the nozzle or the hydrant?

A. Well, I suppose it would be more than that at the hydrant.

Q. How much more, deducting the friction of 600 feet of hose?

A. I suppose there would have been may be 10 pounds.

Q. Ten pounds may be?

A. Yes, sir.

Q. About 25 pounds?

A. Yes, sir.

Q. That's approximate?

A. Yes, sir.

Q. Did you attach your hose to the nearest hydrant?

A. No, sir.

Q. Why didn't you?

A. A company had done connected there. No. 5 connected with the closest hydrant and I connected with the hydrant at 12th. Always connect with the hydrant closest to the fire from our
915 part of the territory.

Q. There was an engine connected with the other hydrant?

A. Yes, sir; did later on. At the time our stream was put on hadn't been any water turned on from that line.

Q. If there had been sufficient pressure, could you have put out the fire?

A. I think I could.

Q. What was the amount of property destroyed during that fire?

A. It burned up 8 or 10 houses and the girls' public schools: Several thousand dollars.

Q. How did the other engines fare as to water pressure when they made their attachment?

A. I was only a member of the company and not an officer and I didn't pay any attention only to my company.

Q. How high above the ground was the fire on the roof at the corner house you spoke of at the time you turned on your stream?

A. Began lower down, about the eaves of the house.

Q. How many feet high would you say it was?

A. Well, a rough estimate I suppose it was 15 or 20 feet.

Q. Well, do you remember the Garrett fire on Aug. 16, 1897: What can you say as to the pressure at that fire?

A. When I went to the fire it was at the back end of the house, two story house, back end of it was just one room; and the fire had started——

Q. You mean one story?

A. Yes, sir; one story; and the fire was between the par-
916 tition and the main part of the house in the back room, just started up; and when we turned on the water from that plug we didn't get any water—any pressure sufficient to do any service at all until it got up on the body of the house—the top of the house was on fire.

Q. Could that fire have been controlled if you had had the water?

A. I believe with one good stream I could have put it out.

Q. How near was the hydrant where you attached the hose?

A. Right on the corner—right at it.

Q. How high could you throw the water?

A. Four sections of hose: The question you asked me, how high could the water have been thrown?

Q. How high could you throw the water?

A. I don't think the water went over, to be accurate, I don't believe it went over ten feet.

Q. How much pressure — that indicate?

A. I can't say exactly.

Q. Was it more or less than 20 pounds?

A. I should think it was less than 20 pounds.

Q. More or less than 10 pounds?

—. No, I think it was over ten pounds.

Q. Fifteen pounds?

A. Yes, sir.

Q. What would you say?

A. I would say it was between 15 and 20 pounds.

Q. Do you remember the fire of June 7, 1899, when six one story frame dwellings were burned on 6th Avenue between 6th and 7th Streets?

A. Yes, sir; I was on the street car when the alarm was turned in.

Q. You have got a record as to the pressure of '99?

917 A. Yes, sir.

Q. I will ask you as to the conditions at that fire and I will get the amount of pressure from the records. I will ask you if there was sufficient pressure at that time?

A. There was not. I was on the car when the alarm came in and when I got there there was a place on the one story house not larger than three feet square. I could have put it out with a bucket. When we hitched to the hydrant the water would not go to the top of the house and time we got the steamers connected up it caught two adjoining houses and burned up six of them.

Q. How about the fire at Col. Swift's house, May 7, 1900?

A. That was under the roof. We carried a line of hose through the scuttle hole and when I went up the ladder in the scuttle hole it

would not throw it up to the top of the house until the roof was afire all over. Then the pressure got better.

Q. At that fire did you have control of the valve to turn on the Rose Hill pressure on Broad Street from the Rose Hill standpipe?

A. What date was that?

Q. May 12th instead of May 7th, 1900?

A. Yes, sir; turned it on at No. 1 engine house.

Q. Do you know whether that was turned on or not?

A. Well, virtually I do, because the engineer was instructed to always turn the valve on before the apparatus leaves the engine house. I didn't see him turn it on but those were the orders issued to him then and are now.

918 Q. Could that fire have been controlled if the pressure had been sufficient at the beginning?

A. Yes, sir, we could have put it out with less damage.

Q. What was the damage?

A. Burned the roof off.

Q. What time of day was that, do you remember?

A. Well, it was along somewhere about mid-day, I suppose. I don't remember exactly.

Q. At the Swift fire was there a still alarm given or general alarm, do you remember?

A. I think it was first a still alarm and I think the box was pulled afterwards. Not sure about that.

Q. Do you turn on the Rose Hill water at a still alarm as well as a general alarm?

A. Yes, sir; we have two taps that come in; and if the location of the fire is below 14th Street, the engineer turns on the valve immediately.

Q. Then you don't have to telephone the Water Works power house or even communicate with them to get the Rose Hill pressure?

A. No, sir.

Q. Is the pressure ever supplemented by pumping directly into the mains?

A. From the pumping station?

Q. Yes?

A. Yes, sir; they can do that.

Q. As a matter of practice do they do it?

A. I think not.

Q. So when you receive an alarm do they increase the pressure by filling the Rose Hill standpipe?

A. Yes, sir.

Q. If that stand pipe was full it would not be necessary to pump there, would it?

919 A. No, sir; it would run over.

Q. These fires that I have asked you about, especially the Preer fire, did the firemen perform good service on those occasions?

A. Well——

Q. Did they discharge their duty as good firemen?

A. Yes, sir; with the amount of water they had.

Q. I mean their own conduct—any dereliction among the fire-

men, anything of that kind—did they perform their duty as they should have done?

A. They did.

Q. Take the St. Paul Church, September 13, 1901, 3:15 P. M., state the circumstances relative to that fire?

A. When we arrived at that fire, there was a still alarm, there was a little place on the corner of the church at the back end. We first started to get up there with a ladder and then we found a scuttle hole over the organ and I took a line of hose up through the scuttle hole with my men and got as close to the fire as I am to Mr. Palmer (about six feet).

Q. How many feet would that be, three feet?

A. I would say six feet and the water just would run out of the nozzle. Only one sweep of it and I could have put out the fire near the corner of the tin roof. Just burned along under the sheathing and rafters.

Q. What distance was that above the ground?

A. The height of the St. Paul's Church: I would say it was 30 feet at that time. Time we could attach a steamer and before they sent a man to turn the valve on, the whole roof was on fire and practically destroyed.

920 Q. What was the result of that fire?

A. The roof was destroyed and the church damaged. The brick walls they were not hurt.

Q. As to the R. C. Golden fire, April 12, 1902: Do you remember the conditions then?

A. Yes, sir. No. 1 engine was attached to a hydrant there on a dead end on 13th Street. The engine could not get any water and had to stop and take the leaves out where they sucked in through the strainer into the engine. There was another engine on 12th Street pumping at the same time; and when we should have had water there we didn't have any and the house burned to the ground.

Q. What sort of a house was that?

A. Two story house.

The MASTER: What year was that, 1901?

Mr. WIMBISH: 1902.

Q. The Columbus Iron Works fire: what were the conditions there: You have stated some; but I will get you to repeat them?

A. As I stated about that engine—I was assistant chief at that time and I had charge of that part of the fire. There were several frame houses, 8 or 10 on that block between 8th and 9th streets and I was trying to stop the fire. If the engine had worked at 8th Street and Front, my reserve engine, if I could have gotten sufficient pressure, I could have saved 5 or 6 houses and I could have stopped the fire before I did; and before I could have moved the line of hose and moved my engine to Broad Street and attach it there where I got better service, it burned up at least five more houses before I did stop it.

921 Q. What would you say was the extent of the property loss at that fire?

A. From my knowledge I am satisfied three or four frame houses—4 or 5 3 or 4 room houses.

Q. Do you remember what they call the Garrard fire, when Mr. Garrard's houses were burned?

A. Yes, sir.

Q. Please state what that was: what the conditions were there?

A. That was right after the Iron Works fire, in May, to the best of my recollection. I was then assistant chief at No. 4 engine house. I arrived there and was in charge before the chief. I being close by. When I got there this company, No. 5, had laid a line of hose and had gone up in the alley between the houses. And on one side of the house about 6 foot square, I imagine, one story house, was afire; and had the water gone to the top of it we could have put it out; and time we got the engine connected up and got the pressure, a half dozen more were on fire and burned up twenty odd—not that many. I don't remember exactly.

Q. How high were those houses?

A. Just small one story houses, not over——

Q. How high was the water thrown?

A. I don't suppose the water, it didn't go over 8 feet, I don't suppose, out of the nozzle. Didn't go up to the fire on top of the roof.

Q. That was the fire in St. James Alley, wasn't it?

A. Yes, sir.

Q. May 30, 1902: If you had had sufficient water how much would the loss have been on that occassion: What could you
922 have confined the loss to?

A. To the best of my knowledge it would not have been over $10 or $15 at the outside.

Q. Now state as to the Loeb residence and Mattress Factory fire on 5th Avenue, Nov. 27, 1902: How high could you get water then?

A. I was at No. 4 at that time within a block of the fire: and when we got there the mattress factory was on fire and we turned our attention to that: and we saw that was practically gone and we turned our attention to the house. I carried a stream in there and had one around on the south side of the house. At first the water wouldn't go on top of a one story house. We put the steamer on to a plug at a dead end but we didn't get any better results hardly than the plug stream.

Q. What was the result of that fire?

A. It burned up the mattress factory and destroyed his residence practically—some of it remained: burned the roof off and the back part of it.

Q. If you had had sufficient water what would have been the result?

A. Well, I won't say positively, but the chances are that we could have saved his residence; but on account of the inflammable material in the mattress factory I don't say that we could have saved that.

Q. Have you had any trouble with mud, leaves or trash in the mains except on the one occasion you speak of?

A. Yes, sir. At the Columbus Iron Works fire steamer No. 1

there had leaves in it; and the Loeb fire I have just spoken
923 of found leaves in it; and I think I have spoken of the Golden fire. The Golden fire two engines had the same trouble, had leaves in the strainer of engine No. 1 and No. 4.

Q. Have you enumerated all the fires you have attended since your connection with the fire department?

A. No, sir.

Q. Have you enumerated all at which there was any trouble in getting water or pressure?

A. No, sir.

Q. What can you say generally on that line?

A. Well, on the four inch mains we always had bad results, with a fire, say more than an ordinary fire, and what I mean by an ordinary fire is where there is a small blaze on the roof that don't get down to the bottom of the house so we can't get at it, where the heat is great and have to stand on the outside of the building, we have had poor results from steamer or plug pressure. That is off of Broad Street.

Q. Did you have any trouble with either pressure or quantity of water in 1890?

A. Yes, sir.

Q. Did you have any prior to that time?

A. Yes, sir; according to the condition of the building and the inflammable material that is in the building and the size of the mains, we have had trouble—and the time of day we are called upon to go to the fire. Generally before they had this pressure service, along about 12 o'clock every day, the pressure was always lower than at any other time; but it would catch up in the night, give the standpipe sort of a chance to catch up at night. That was before
they had the Rose Hill standpipe. Whenever we strike a
924 dead end on a four inch main and attach to two plugs, the results are always bad and are now.

Q. The Rose Hill standpipe was built in 1900?

A. 1900?

Q. Connected up in 1900?

A. Yes, sir.

The MASTER: I understand you to say that you have trouble now with two openings of a hydrant at the present time?

WITNESS: A. Yes, sir; on four inch mains we do and on mains that are not tied in off of Broad Street, dead ends if it is larger than a four inch main if it is a dead end, we don't get good results. A dead end is where the water can't circulate more ways than one. The small mains where there are more plugs than one upon it we can get two streams without an engine; but if we open up another hydrant we don't get any results; and have to use steamers to get any results at all ordinarily. On these small mains very seldom we can ever get more than 60 pounds pressure with steamer where we have two steamers at work on the same line of pipe. Whenever, as a rule, we try to run over 60 pounds water pressure, our engine will run away—sucks air. Gets the capacity of the pipe or flow of water and can't draw any more and naturally sucks air and can't get any more results.

Q. You mean 60 pounds pressure by the use of the engine?
A. Yes, sir.
Q. That gives the pressure supplied by the engine?
A. Yes, sir.
925 Q. In addition to the natural pressure of the water?
A. Yes, sir; what we call engine pressure.
Q. Is the distribution system in this city, including the 12 inch supply main from the reservoir, sufficient to afford adequate fire protection to property in this city?
A. It is not.
Q Will you state your reasons for that conclusion?
A. In the first place the main is not large enough that brings the water here four miles; and then the distribution mains, after it gets here, are not large enough to give the pressure in sufficient quantity that the city demands for fire purposes, because you can not force the water through the pipe—they are too small. When the demand is greater than the supply of water, you can't draw on that pipe more than the capacity of the pipe or the pipe will bring. The pipes are not tied in—a lot of dead ends that are not tied in across town as they should be. For instance: a 12 inch rather a ten inch main runs out 12th Street here. While the block right there on First Avenue, the Masonic Temple, is on a six inch main. This ten inch main goes out 12th Street from here to Sixth Avenue. This block here (referring to map) is on a four inch main. You go up to 14th Street on First Avenue, 13th Street, it is a dead end, not tied in. The same way out here at Loeb's Mattress factory. And down town at the lower end of each street is a dead end. And for instance you take from 11th to 13th Streets on First Avenue, it is a six inch main. Down below on that Avenue it is a four inch
926 main. Take over here on Second Avenue it runs from 12th to 15th Streets is a six inch main—I mean a four inch main. Then you drop on down to 8th and 10th Street is a four inch main. Now I won't be accurate, as I said—then out on Third Avenue you go from 15th Street to 6th Street nothing but a four inch main clean down. And then on 5th Avenue from 13th to—from 12th Street to 13th Street it stops there—it is a dead end, not tied in at all; and from 12th to 10th Street it is a six inch main. The size of the mains vary right in the heart of the city. Out here on 6th Avenue right in the heart of the manufacturing district, you might say, the Swift Mills, it runs from 12th Street up to about between 13th and 14th Streets—14th and 15th, it is a four inch main; and below 12th Street it is a six inch. Where you strike a block that has a 4 or a six inch main especially where it is not tied in, you always get bad results. The size of the pipes are so small you can't draw the water through them fast enough to supply the demand at a fire for a steamer using 600 gallons per minute.
Q. No matter how great the source of supply may be?
A. They can't force the water through a four inch main fast enough to supply the demand for a fire that is more than ordinary. I mean when two houses get afire and gets down to the boddy of the house where the heat is so great we have to stand off any distance to

fight it, always get bad results. The only way we can do is to hit the fire in its incipiency or get it between the roof and the ceiling
927 where we can get to it before it gets down to the body of the house and the heat is not so great.

Court here took a recess until the next day.

FRIDAY MORNING, *February* 26, 1904.

Court met pursuant to recess and the hearing was resumed:

Examination of witness I. F. PEARCE resumed by Mr. WIMBISH:

Q. In your testimony of yesterday, you spoke of the pressure, that is, you made an estimate of the pressure at the hydrant at certain times when you had different lengths of hose, etc.: I wish you would state what enters into the question of pressure and upon what you base your estimate?

A. Just simply a conjecture on my part entirely. Depends upon the amount altogether of pressure at the nozzle or at the hydrant. It depends upon the length of hose you have from the hydrant, the size of the main, the size of the nozzle and the circulation from the plug where the pipe is tied in, whether it is on a dead end, etc. Depends upon circumstances a great deal.

Q. Al- those things affect relatively the pressure?

A. They do. It is a hard matter to frame an intelligent answer as to the actual amount of pressure at a fire that way, because conditions are such that you can not arrive at it accurately without calculating on the situation of the mains, size of the nozzle, etc., as I have just stated.

928 Q. How was the chief of the fire department elected prior to 1898 and since '98?

A. There was what was called the board of control from the volunteer fire companies, elected from the respective companies that formed this board of control and they elected the chief engineer up to 1898 and the action of this Board was subject to ratification by Council. In 1898 council elected themselves independent of this Board of Control.

Q. Have we had any volunteer department since 1898?

A. No, sir.

Q. Any members of the department who were volunteers?

A. No, sir; this disbanded when council took that privilege away from them.

Q. Do you re-call the fire in 1902 on the East Highlands—I believe it was in 1902?

A. Yes, sir; we had a fire the latter part of September, 1902, on Railroad street and 10th Avenue, about 10 minutes before 12 o'clock one night. The house was on fire on the railroad but when I got there though, that was about destroyed. No. 2 company was there but could not get any water on top of the house; and I run in there with the No. 1 company with the same results. Never could get the stream up on top of the house; and the next house caught and

both burned to the ground; and if there had been any more houses close by they would have burned.

Q. Why couldn't you get a stream?

A. On account of the inefficient water pressure. After the fire was out I telephoned the pumping station; and the man at
929 the pumping station told me it only registered then 40 pounds on 18th Street. I was away above that and that practically gave me no pressure at all. That was some time after the fire had burned out.

Mr. WIMBERLY: I don't suppose the gentleman will insist that what somebody told him is evidence?

Mr. WIMBISH: Certainly. He was in charge of the pumping station.

The MASTER: He stated that somebody told him. That would not be relevant. Let it go in. Let the witness state the facts within his knowledge.

WITNESS: I knew that there was something wrong and the next day I saw Mr. Preer and I asked him the trouble and he told me that the water was low in the Rose Hill standpipe; that in the early part of the night up to 12 o'clock, in giving this standpipe here on Broad Street time to fill up for domestic purposes down town and use the next day, they didn't start to pumping into the Rose Hill standpipe until about 12 o'clock that night, just commenced pumping in from the night before and it had run down; and it was at a low state. That's the only way he could account for it.

Mr. WIMBERLY: I suppose we had better enter the same objection here.

The MASTER: This is a statement of Mr. Preer and he has stated that he was the superintendent of the water works. I think that is admissible.

Q. Have you the records showing the pressure as indicated by the gauge at No. 5 engine house?

930 A. Yes, sir; I think I have them from '98.

Q. Have you them with you?

A. Yes, sir; they are here.

Q. I hand you some sheets and I will ask you if you have examined these in comparison with the records?

Mr. WIMBERLY: Are you going to put the records themselves in?

Mr. WIMBISH: No, I am going to put these in unless you object to it.

Mr. WIMBERLY: If they will put the originals in we will try to get Mr. Preer or some one to check them up with this sheet.

* * * * * * *

Mr. WIMBISH: If the court and counsel want this mass of records to go in, we have not the slightest objection.

Q. Mr. Pearce, what was the minimum pressure on May 3, 1898?

Objected to on the ground that the witness is attempting to interpret the records when the records speak for themselves.

Objection overruled.

Q. What are these?

A. These are records kept at No. 5 engine house, showing the pressure at stated hours from the reservoir and also from the Rose Hill standpipe when it is turned on, down town.

Q. Is No. 5 engine house on a level with the floor of the market house?

A. Yes, sir.

Q. Now then, your memorandum, is that correct?

(Handing witness paper.)

931 Objected to by complainant.

Mr. WIMBERLY: I am perfectly willing for these original records to go in showing the pressure and for the witness to explain how the record shows the pressure; but I don't understand that the witness can give testimony different from the record itself. I object to that paper, as to what it shows, unless they put the records in.

Objection overruled.

WITNESS: This is a memorandum of pressures taken from the recording gauge at No. 5 engine house at these stated dates, as they appear on this paper.

(This objection was met by an agreement, which appears on page 454, Volume No. 1 of this record.)

WITNESS: This record I have got here is of the Rose Hill standpipe. Have no recording gauge except as is shown on the gauge at No. 1 engine house. The other was at No. 5 engine house.

Q. Take for instance 1901, — that a record of the full pressure, both from the Rose Hill and Broad Street standpipes or is that a record of the pressure of only one?

A. The records are from both, whenever the Rose Hill standpipe is turned in.

Q. Can you state from those records when the Rose Hill standpipe was turned in?

A. No, I can not. The pressure, when the Rose Hill standpipe was turned in, would be greater than when it was not.

Q. Let's see your record for Rose Hill?

(Here witness produced book.)

A. This record was taken by order of Mayor Chappell, June 24, 1902. This is a record book kept by the chief engineer of the
932 fire department. This is a record of all his official acts during each day and also the records that would be kept by orders from the Mayor or Chairman of the Fire Committee—all official acts.

(The MASTER:)

Q. Of pressure?

WITNESS: It shows the pressure from the Rose Hill stand pipe.

The MASTER: What page are you testifying about?

A. On page 41, June 24, 1902. "Owing to low pressure reported from engine house- No. 1 and No. 5, and complaint from takers on Rose Hill, I was ordered by his Honor, the Mayor, to take the

pressure at the Rose Hill standpipe twice a day until July 2nd. The following is the result:"

(See pages 469 and 470, Volume No. 1, for this record.)

Objected to on the ground that it appears that Mr. Geo. J. Burrus kept the records of pressure; and he alone would be the only person who could testify as to their correctness.

The MASTER: The witness says that this is the book kept by the Chief of the Fire Department.

Mr. WIMBERLY: But not by himself as chief engineer.

WITNESS: Yes, this is kept at this particular time; but I was not the chief then. Mr. Burrus was the chief at that time. He was the chief of the fire department.

The MASTER: He was the man that made those entries?

933 A. Yes, sir.

Mr. WIMBERLY: Without calling Mr. Burrus this is nothing in the world but an unsworn statement.

* * * * * * *

The MASTER: I will ask the witness if they keep the records correctly?

WITNESS: We are not at this time keeping a record of the Rose Hill pressure.

Q. You are keeping that book of records?

A. Yes, sir.

Q. You are making entries on that book officially?

A. Yes, sir; every day.

Q. Official record?

A. Yes, sir; the transactions of the department.

Mr. WIMBISH: I will ask this witness if that record is correctly kept?

WITNESS: To the best of my knowledge and belief it is a correct proceeding.

Q. I will ask you if the book was regularly kept, your entries of record?

A. Yes, sir.

Q. And daily kept?

A. Yes, sir.

Mr. WIMBERLY: We object to this testimony unless it comes up to the law.

Mr. WIMBERLY: I would like to ask him some questions about it.

The MASTER: You will have an opportunity of examining him when he gets through with him.

Mr. WIMBERLY: We object to his reading from the entries on the book. The book itself is not in evidence.

934 Mr. WIMBISH: I want to get in the record what the pressure is. I am going to offer the book.

Mr. WIMBERLY: We object to this method of examination. We object to the witness reading what is on the book. If the book is admissible, it proves itself—I mean it is the best evidence as to its contents. * * * Also the witness did not make the entries.

Objection overruled.

Q. What was the record on these various days?

Mr. WIMBERLY: Your Honor understands we object to all this?
The MASTER: Yes, sir.

WITNESS:

June 24, 6:50 P. M., 25 pounds.
June 25, 8:55 A. M., 30 pounds.
" 5:55 P. M., 25 pounds.
" 26, 8:30 A. M., 25 pounds.
" 26, 6:23 P. M., 15 pounds.

Q. Where were those tests made?
A. Made at the corner of 21st Street and Hamilton Avenue. They were reported to Mayor Chappell in writing, July 2nd.
The MASTER: 1901?
WITNESS: 1902.
Q. I will ask you if those pressures were sufficient to afford protection against fire?
A. They were not.
Q. What did those pressures indicate with reference to the state of water in the standpipe?
A. That it was of a low stage. When it is full it should register 80 pounds at No. 1 engine house.
935 Q. When was the pressure the lowest?
A. Along about the middle of the day.
Q. Lowest then?
A. Yes, sir; and in the afternoon about 5 or 6 o'clock.
Q. How would the pressure be from 6:50 in the morning to 1020, with reference to average pressure?
A. Well, I think it would be better then than it would be later on. You would get the lowest pressure, as I said awhile ago, along about noon and 5 or 6 o'clock in the afternoon.
Q. When would be the highest pressure?
A. Well, it is according to the time they were using the pumps. At that time it would be better along about three or four o'clock in the morning, say six o'clock in the morning before they began to draw on it down town. At that time they had one pump there at the Columbus Power Company that did most of their pumping to fill up the standpipe.

Mr. WIMBISH: We offer a portion of page 41 of this book, ending with the words "July 2nd," when it was reported to Mayor Chappell.

Cross-examination (by Mr. WIMBERLY):

Q. What is this book?
A. This is a record book kept by the chief engineer of the fire department.
Q. Record of what?
A. Of the proceedings or doings or the official acts of the chief engineer. His official record of the amount of supplies for the engine house, amount of pressure, etc.
Q. This is a record he keeps: "Granted fireman Huff six hours

leave of absence; ordered five bales of hay; granted D. E. Munn six hours leave of absence": That sort of a record?

936 A. Yes, sir.

Q. Are there any records of fire pressures except the record—I mean in this book, beginning on page 41, from June 24, 1902, to the end of page 46 that you wrote?

A. Yes, sir; there are records there at different times of tests made.

Q. Are there any others except these?

A. As to the amount of pressure?

A. Yes; at different times

—. *or* I can show you where we made tests at different plugs to ascertain the pressure.

Q. That's the only thing where there is anything like water pressure?

A. Daily record: these pages here.

Q. You have not yourself, since you have been chief, made any such record as this, have you?

A. I have not, except as I stated at times.

Q. Daily record?

A. No, sir; not from the Rose Hill standpipe.

Q. The only daily record that appears on this book at all is the one that you read from beginning there?

A. Yes, sir.

Q. Mr. Pearce, were you present when any of these tests that you have read out were taken?

A. I was not.

Q. Did you see these records made?

A. I did not.

Q. Of your own knowledge, have you any knowledge at all as to whether it is correct or incorrect: I don't mean your opinion, but I mean of your own knowledge?

A. Only from the official record from that book, as they

937 appear there.

Q. That's all you know about it?

A. That's all.

Q. I am not asking you about what you might suppose or believe: As far as you know, you don't know that a single one of these figures are correct, of your own knowledge?

A. Only as I find them in the book.

Q. Of your own knowledge you don't know that any of them are correct, do you?

A. Not of my personal knowledge.

Q. You have no way of knowing whether any of them are correct?

A. No, sir.

Q. You have no knowledge on the subject except what you find in this book?

A. Well, I have an idea as to what the pressure was at different times.

Q. I mean in this?

A. No, not as to what the exact number of pounds was, no, sir.

Q. You say this was at the corner of 21st street and Hamilton Avenue: You only know that because this book says so?

A. I was not at the tests; but I know when the tests were made.

Q. You heard of it?

A. Yes, sir.

Q. You never saw any test made there?

A. No, sir.

Q. Not a single test?

A. No, sir.

Q. You only know what you heard?

A. That's all.

Q. Did Mr. Burrus have assistance in making the tests?

A. Of my own knowledge I don't know that. Always have one of the men to go with us when we make these tests. We have a gauge that we keep up to the engine house that we can attach at any plug and get the exact pressure at any time.

938 Q. Is Mr. Burrus dead or alive?

A. He is living.

Q. Where does he live?

A. Lives on 9th Street, between Broad and First Avenue.

Q. Lives here in Columbus?

A. Yes, sir.

Q. He is here now?

A. Yes, sir; I saw him this morning.

Q. Mr. Pearce, these pressures that you speak of, were the pressures on the higher portion of the city, were they not, that is, on Rose Hill—what is known as Rose Hill, at the corner of 21st Street and Hamilton Avenue, is a great deal higher than Broad Street?

A. Yes, sir.

Q. And on a level with the foot of the stand pipe on Rose Hill?

A. Yes, sir.

Q. Now take the first one, say June 24, as you read that, at six fifty P. M., you have got the pressure here 25 pounds? I believe that's what you read?

A. Yes, sir.

Q. Now on the same day at the No. 1 engine house, lower down, on the same page, the record of pressure ranged from 80 pounds, the highest and 45 pounds the lowest: that's true, isn't it?

A. Yes, sir.

Q. Wasn't that down town where the engine house was 9—the business part of the town?

A. That the same date?

Q. Same date, June 24: was that down town where most of the business part is of the city: The pressure was very much greater than it would be up on a high level like 21st Street and Hamilton Avenue, wouldn't it?

A. The pressure would be more at the same hour, 6:20.

Q. It don't appear at identically the hour it was taken six times during the day?

939 A. It does state the hours.

Q. States the hour of each one; but none taken at precisely the hour the test was made up here?

A. No, sir.

Q. It ranges from 80 pounds the highest to 45 pounds the lowest?

A. Yes, sir.

Q. These tests on Rose Hill, 21st Street and Hamilton Avenue, the tests were taken at different hours on different days?

A. Yes, sir.

Q. No attempt to be precisely the same hour as the tests were taken down town; but we will have to get the average: On June 25th the record went as low as 35; and on June 28th the record got as low as 20 pounds at one time and at another hour I believe as low as 13 pounds: That's the pressure you read here, I believe for June 28th: Seems to have been two tests on that day?

A. Yes, sir; one at nine in the morning.

Q. And the other at 6:40, 13 pounds.

Q. On that same day down to-n it ranged from 30 to 40 pounds?

A. Yes, sir.

Q. So really this is in effect, this is Rose Hill pressure you speak of according to these records, assuming the records to be true: Of course I will have to ask these questions until the book is offered. I can't know what your Honor's ruling is going to be. I take it for granted that if the book is excluded——

The MASTER (Interrupting.) It all goes out.

Q. These tests, in effect, are the same as if they had been taken at the Rose Hill standpipe, that is, its base?

A. Yes, sir; close to it.

940 Q. Do you know the difference in the level—I believe it is in the record though, some 80 feet, isn't it, between the level there and the level at the market house, the business part of the town?

A. I think that is about correct.

Q. These records at No. 1 engine house, you were not present——

The MASTER: If I let it go in I will let that whole page go in; and you have the right to examine him about any other part of that page that has not been read, because the page goes in and any writing on it you have the right to examine him on it.

Mr. WIMBISH: Your Honor certainly won't force us to put in more than we want, a different subject matter entirely. We don't want it as our evidence. There is a certain portion of it that we don't think has any bearing on this case.

The MASTER: I understand you tender a certain portion of the page. That is down in the record. That part you offer.

Mr. WIMBISH: On this same page.

The MASTER: I understand it is not your evidence except what you offer on that page.

Q. On the same page and during the same month, beginning with

June 18, the pressure at that time was 80 pounds at 6 A. M. and 80 pounds at 9 A. M.?

A. Yes, sir.

Q. 75 pounds at 12 M.?

A. Yes, sir.

Q. 70 pounds at 3 P. M.?

A. Yes, sir.

Q. 65 pounds at 6 P. M.?

A. Yes, sir.

941 Q. That was the lowest during that day?

A. Yes, sir.

Q. I have already asked you about June 24, as you read there when the pressure was 80 pounds at 6 A. M. and 80 pounds at 9 A. M.?

A. Yes, sir.

Q. Sixty pounds at 12; 50 pounds at 3; 45 pounds at six?

A. Yes, sir.

Q. And fifty at nine?

A. Yes, sir.

The MASTER: These records in this book on this page refer to presure at No. one engine house?

A. Yes, sir.

Q. And not from Rose Hill?

A. Yes, sir; pressure from the Rose Hill standpipe, from there down.

Q. They were taken at No. 1 engine house?

A. Yes, sir. Those above were taken at 21st Street on top of the hill.

Q. Well, on June 23, which is the day before the first entry up here, I believe, the pressure at the engine house at 85 pounds at 6 A. M. and 80 pounds at 9 A. M. and 75 pounds at 12 noon; 65 pounds at 3 P. M. and 60 pounds at 6 P. M. and 55 pounds at 9 P. M.?

A. Yes, sir.

Q. I believe I asked you about the 24th: What is the date of the lowest pressure I asked you about. The last day in June: you read the pressure at the corner of 21st Street and Hamilton Avenue?

A. Yes, sir.

Q. Now on that same day, the last day of that month, in order to get at the average pressure, at No. 1 engine house was 75 pounds at 6 A. M.?

A. Yes, sir.

Q. Seventy five pounds at 9 A. M.?

A. Yes, sir.

Q. And 60 pounds at 12 noon?

A. Yes, sir.

942 Q. Fifty five pounds at three P. M.?

A. Yes, sir.

Q. Forty five pounds at 6 P. M.?

A. Yes, sir.
Q. Fifty five pounds at nine?
A. Yes, sir.
Q. What's that "ave" in the last column?
A. That means average pressure.
Q. That means that on June 18th the average pressure was 75 pounds?
A. Yes, sir.
Q. On June 22nd, take about a week later, it was 72½?
A. Yes, sir.
Q. On June 23rd, the day before this first test was made, the average was 70 pounds?
A. Yes, sir.
Q. On June 24th, the same day this test was made that you read out, the average was 60 5/6 pounds?
A. That's correct.
Q. Take the 30th again: I believe I asked you about that same date above: the average was 60 5/6 pounds?
A. Yes, sir.
Q. On July 1st, the first day of the next month, the same day two tests were made, you read out, the average pressure at No. 1 engine house was 70 pounds?
A. That's right.
Q. The lowest pressure recorded at all that day was 65 pounds?
A. That's right.
Q. On July 2nd, 1902, which is the last day the test was made you read out above, the average pressure at the down town engine house was 61⅔ pounds?
A. That's right.
Q. The next day after that it was 70 pounds?
A. That's correct.
943 Q. The next day after that it was 66 2-3 pounds: that's right?
A. Yes, sir.
Q. July 4th and 5th it was 77½ pounds?
A. Yes, sir.
Q. July 6th, it was 71 2-3 pounds?
A. Yes, sir.
Q. July 7th, 67½?
A. Yes, sir.
Q. July 8, 72½?
A. Yes, sir.
Q. July 9, it was 66 2-3?
A. That's right.
Q. Well, now——

Mr. WIMBERLY: I believe your Honor said I should confine my examination to that page?
The MASTER: Yes, sir.

Q. In this record one or two places it shows "valve closed" and "valve opened": What does that mean?

A. It means that the valve would be turned on at No. 1 engine house and would throw the Rose Hill pressure into the lower part of the city below 114th Street. We turn it on to get the benefit of the Rose Hill pressure.

Q. Which means that the valve was closed or opened?

A. Yes, sir.

Q. When the valve is opened you get the benefit of the Rose Hill pressure?

A. Yes, sir.

Q. And the valve closed means the pressure outside of the Rose Hill pressure?

A. Yes, sir. When the valve is turned on we get that pressure at No. 5 engine house.

Q. How is it when it is closed?

A. Well, when the valve is closed——

Q. (Interrupting): Here's what I want to get at: in some places it says "valve closed" and then again "valve opened:" For
944 instance you take July 11th, you have got in one place here "valve opened," 45 pounds; and then in the next column "valve closed," 70 pounds: What is the meaning of valve opened and valve closed?

A. Whenever we open the valve it diminishes the pressure; and when it is closed it is greater, because it don't circulate below 14th Street down town from the Rose Hill standpipe. Always open the valve in case of an alarm of fire. Sometimes we would open it by orders of the water works people. The last few months we kept it opened for 2 or 3 months without closing it at all, pumped directly all over town.

Q. When it is opened you get direct pressure?

A. Yes, sir; from the Rose Hill standpipe.

Q. When it is closed you don't get the Rose Hill pressure?

A. No, sir; not below 14th Street. Do above 14th Street.

Q. This No. 1 engine house is below 14th Street?

A. Yes sir.

Q. Take sometimes when the valve is closed, say on June 22nd, two days before this test was made, with the valve closed you got 80 pounds pressure?

A. Yes, sir.

Q. And on July 2nd, the last time it was made, with the valve closed, you got 65 pounds?

A. Yes, sir.

Q. On July 11th, which is the last entry that appears on that page, you had 45 pounds with the valve opened and 70 pounds with the valve closed?

A. Yes, sir.

Q. Seventy pounds pressure, of course I mean where you can retain that pressure, if there are not too many streams for the size of your pipe, gives you a stream of vertical height of about 140
945 to 150 feet or a little over two feet to the pound?

A. That's the way it is figured, according to the size of the mains, where the main is large enough to get the benefit——

Q. Of the full pressure?

A. Yes, sir.

Q. Of course if it is a very small main and you have too many streams from a small main, you would not get the pressure out of it?

A. That's right.

Mr. WIMBERLY: There are some matters that Mr. Garrard is a little more familiar with than I am; and I would ask that he be allowed to examine the witness on them.

The MASTER: Very well.

(By Mr. GARRARD:)

Q. Just above 17th Street—I don't know whether it is shown on this map: but you are familiar with it: Do you re-call the fact that there is a row of valves commencing there, there and there (indicating on map), on 18th Street, so that by screwing these valves down, the pump at 17th Street would pump directly into the mains down town?

A. Of my own personal knowledge I don't know that that is the case; but I have been told that there are three valves.

Q. And in that way direct pressure could be put on the entire down town system, by screwing those valves down?

A. If you cut if off from the Rose Hill standpipe.

Q. What would be the effect of pumping direct pressure directly into the mains down town?

A. It would increase the pressure materially.

Q. Wouldn't it run it up as high as the pipes could
946 stand it?

A. Well, you would have to consider the capacity of the pumps.

Q. Are theyc not very strong pumps, not only at the power house but the pumps at the filter plant also?

A. Well, the pumps at the power house are good sized pumps.

Q. Isn't it a fact that the pump at the power house had to be geared down to run at less than its full capacity?

A. I never heard of that before.

Q. Don't you know that these valves were put in by the direction of the Mayor and Council, at 18th Street, in order to put direct pressure on the mains; and in point of fact it has never been called for?

A. I don't recollect any such proceeding as that. I know that I was told by Mr. Preer that those valves were there.

Q. Who is Mr. Preer?

A. He is the superintendent of the water works company.

Q. What was his object in telling you that, so that you could use them if you wanted them?

A. Well——

Objected to.

Mr. GARRARD: I want to show that we put in those valves by an understanding with the Mayor and Council; and expect to prove it.

The MASTER: You can prove any statement that Mr. Preer made him as superintendent of the water works company.

Q. Didn't Mr. Preer tell you that these valves up on 18th Street were for the purpose of giving direct pressure?

947 A. Before the valve was put in the No. 1 engine house, that valve from the Rose Hill stand pipe was always turned on at the car barn. Had a gong at the car barn and arrangements were made by the water works people at the car barn to turn it on there just the same as it is at No. 1 engine house. After we have had the valve at No. 1 engine house, that valve never has been used, so far as I know. The only knowledge I have of a valve turning on the Rose Hill pressure is the one we have at No. 1 engine house now.

Q. At first the Rose Hill standpipe water came down as far as 17th Street?

A. Yes, sir.

Q. It was afterwards brought down as low as 14th Street and then the valve was connected with the Broad Street standpipe?

A. Yes, sir; the valve was connected with the Broad Street standpipe. The valve was located at No. 1 engine house.

Q. The valve at that time was located at the No. 1 engine house?

A. I don't mean that it is connected with the Broad Street standpipe. When the Rose Hill pressure is turned on, the Broad Street standpipe is cut off.

Q. It was fixed so you could turn the water on without emptying the Broad Street standpipe?

A. Yes, sir; that's the way I meant to say it was connected with the Broad Street standpipe.

Q. This valve it was so that you could turn on the water from the Rose Hill standpipe and allow the water to flow down into the lower part of the city on Broad Street below 14th Street?

A. That's right.

948 Q. Is there or not a back pressure there or an arrangement to cut off the Broad Street standpipe?

A. When the Rose Hill stand pipe is turned on?

Q. Yes?

A. That's correct.

Q. So as to hold all the water in the Broad Street standpipe so it would not run empty?

A. That's the way I understand it.

Q. This row of valves on 18th Street, they have been there all of this time, have they not?

A. You mean 17th Street?

Q. There is really a row on 17th Street and 18th Street: the row of valves that connect the Rose Hill standpipe is on 18th Street, because it is above the City Mills?

A. I don't know that there is any valve on 18th Street at all.

Q. So far as you know are they on 17th or 18th Street?

A. The only valve that I know of, I never did see it, Mr. Preer told me, was there on 17th Street by the car barn.

Q. Isn't there more than one valve: Isn't there a valve on the edge of these pipes that run North so they can be screwed down and cut off?

A. He told me there were three valves there. The one I have reference to is the one that turns on the Rose Hill standpipe.

Q. Didn't he warn you that there was danger in screwing those valves down and turning the pump on the lower part of the city—danger of blowing out the private water connections?

A. No, sir.

Q. Without leaving the Rose Hill standpipe open as a safety valve?

949 A. No, sir; he never told me. I have never had any jurisdiction over the valve.

Q. Did you ever have any orders from the Mayor or from anybody connected with the fire department that by screwing these valves you could give direct pressure on the mains?

A. At 17th Street?

Q. Anywhere in Columbus?

A. No, sir.

Q. If you had had any need for more pressure, couldn't you have increased it by giving direct pressure on the mains?

A. Yes, sir.

Q. You had a system for awhile of turning in what was known as a still alarm?

A. That's correct.

Q. How was that still alarm turned in on the water works—how did that operate?

A. Whenever a still alarm comes in, a still alarm to any engine house, we ring two taps of the fire bell. Those two taps means a still alarm and it means to turn the valve on at No. 1 engine house. If the fire is below 14th Street, he turns that valve on. If it is above, he does not, the engineer whose duty it is to turn the valve on.

Q. When you had a still alarm was it your custom to notify the power house to start the pump?

A. They have instructions to that effect whenever a signal comes in.

Q. Isn't that of recent origin, that you commenced to give that signal to the power house by which the pumps could be started?

A. Did that as far back as 1902, before I was chief the last time.

Q. When the fire alarm rung at the power house, did it

950 not turn on the pumps?

A. You mean recently?

Q. Even before that time: and wasn't there a great deal of complaint on the part of the water works company that the system of notifying the pumping house wasn't sufficient to give them notice to turn on the pumps when really the pumps ought to be turned on?

A. They had a gong and sometimes the gong would get out of fix and they would notify me to have my electrician to come up and fix the gong; that it didn't give the alarm all right.

Q. Didn't the companies go to the fire at the St. Paul Church without having the Rose Hill pressure turned on?

A. I don't know as it was.

Q. You didn't have the pressure from Rose Hill at the St. Paul's Church fire until afterwards?

A. Mr. Preer is the man that turned the valve on, a different plug there at Third Avenue that I did not know was there then.

Q. You could have gotten that pressure by turning on the Rose Hill standpipe at the power house?

A. I would have gotten it to a certain extent. I found out after the fire that I would not have gotten the full benefit until I turned on the valve and got the circulation from the Rose Hill standpipe North of it.

Q. Isn't it a fact though that these still alarms were arranged by electric wires?

A. Yes, sir; the still alarms rung at the power house as well as the two taps.

Q. Rung at the power house as well as in the engine house?

A. That's a fact.

Q. They now know it as well as the chief of the fire de-
951 partment?

A. That's right.

Q. Don't you always get the fire pressure now when ever a still alarm is rung in?

A. Yes, sir; the valve is always——

Q. (Interrupting.) Isn't it a fact when you didn't get it before was because of the want of notification to the power house—the engine house didn't notify the pump house to start the pumps unless you gave a certain signal to them?

A. If their gong worked as ours did—it is on the same circuit, they got the alarm the same as we did: they got two taps.

Q. You thought they did?

A. That's the only way I come to the conclusion. They had the same way of getting it as we did.

Q. It rings all right now?

A. Yes, sir; unless something unforseen happens, like will happen to an electric machine, gets out of fix.

Q. Are you not getting a very good fire service now from the pump house?

A. Well, it is according to the streets and the locality of the fire. On Broad Street I do; but outside of that I can't say that I do; because of the size of the mains.

Q. What do you consider good fire service—How much pressure?

A. Well, as—I should think where I can get the full capacity of from 60 to 70 pounds—from 60 to 80 pounds, and the pipe is large enough to give me the benefit of that pressure, that is good average pressure for ordinary fires.

Q. You mean that is such pressure that you can put out a fire without the use of an engine?

952 A. That's what I mean.

Q. That's what you call good fire service?

A. I do.

Q. Do you not know that when the town was divided up, the understanding with the Mayor and Council was that 14th Street—In

other words that all north of 14th Street was to be put under Rose Hill pressure and all South of 14th Street was placed under the pressure of the standpipe on Broad Street; and that certain mains that were connected with 14th Street were also to remain still connected for a space of a couple of blocks and not connect with 12th Street to prevent the water in Rose Hill Standpipe from running out, as it would have done if they had connected up 12th Street.

A. No, sir; wasn't any such arrangements with council. I don't remember anything like that.

Q. Were they not left there so that these dead ends that you speak of, could get some additional pressure from 14th Street?

A. I hadn't known anything of that of my own personal knowledge.

Q. That's a fact, wasn't it?

A. It would give it more pressure on those dead ends.

Q. Were they not really connected with 14 Street, those dead ends you spoke of?

A. Not all of them. I don't think the one on First Avenue and 14th Street is connected until now.

Q. Wasn't the one on First Avenue—wasn't that the line of pipe that runs up, that 12 inch pipe: were there any fire connections made with that pipe?

A. With the pumps?

953 Q. Were the- any connections with hydrants on that main that run up First Avenue?

A. Not to my knowledge there was not.

Q. Was there any reason for not connecting with the main: Wasn't that the section of main through which the water was pumped to Rose Hill?

A. That's my idea.

Q. Isn't that the only street in that part of the town in which water mains south of 14th Street, I speak of—the dead ends that you spoke of were not connected with the 14th street main?

A. You mean from the Rost Hill standpipe?

Q. Yes?

A. 13th Street is not connected.

Q. 13th Street?

A. 13th Street and 5th Avenue is a dead end now.

Q. Where is that? (Handing witness map of the mains of the Columbus Water Works Co.)

A. The block located on the North side of 13th Street and 5th Avenue.

Q. Where is that block located, on what main?

A. Located on the four inch main that runs from 12th Street to 13th Street there, is a dead end.

Q. Wasn't that not connected for the same reason that I spoke of: that it would empty the Rose Hill standpipe when it was not turned on?

A. I don't know that that is the reason.

Q. Wouldn't that be the effect of making that connection?

A. The water would run down in town?

Q. It would run down in the lower part of the town, and would it not destroy the use of it—lose the benefit of it for fire protection, wouldn't you, if that connection was made?

954 A. The way the present system is arranged now it would.

Q. Would it really affect the system of pumping pressure all over town if that connection was made now?

A. As it stand- now it would. The pressure would run down town.

Q. If they kept the Rose Hill standpipe full and the Broad Street standpipe full also, that could be connected?

A. Yes, sir.

Q. I want to get the benefit of your suggestions: What suggestions would you make to make the service sufficient, as to connecting these four inch mains?

A. You want to know my personal opinion?

Q. Yes, I want your personal opinion?

A. If left to me, I would run ten inch mains across town instead of such blocks as are now on four inch mains; and I would leave the four inch mains between the blocks for domestic purposes; and I would place ten inch mains on streets across town.

Q. How far would you put those ten inch mains apart

A. It would be better to have them on every street, according to where the dead ends are now. Have one run out 13th Street and then connect that with another 12 inch main coming down 6th Avenue and tie it in with a 12 inch main on Broad.

The MASTER: Let me ask you a question: Are there any ten inch mains running across town now?

A. There is one on 12th Street.

The MASTER: That the only one?

955 A. That's the only one I know of.

Q. Isn't that an eight inch main?

A. I have been told that it was a ten inch main: but the plugs are not on it.

Q. That the only ten inch main running across town?

A. The only one I know of. The balance are from 6 to 8. One on 18th, one on 17th and one on 15th.

Q. D-n't you state to me yesterday evening that you could solve the question of water pressure by putting a main of the size you spoke of on ever- other street going east and west and in that way make the four inch mains perfectly available?

A. No, sir; I didn't say make them perfectly available. It would increase the efficiency of the service materially. If you were allowed to pick out streets where those dead ends——

Q. Couldn't you connect those dead ends to the nearest main?

A. Yes, sir.

Q. Couldn't you connect those dead ends you spoke of that are near the main on 12th Street?

A. Yes, sir; those plugs could be put on that main.

Q. How many of those dead ends are there in all?

A. Well, I have never figured that out; but I can call them over.

The MASTER: Doesn't the map show that?

Q. Then by running in a line of these mains across town: for instance we will take this street, 13th Street, or any one of these streets where there is a four inch main running north and south, a main of the size you spoke of, a ten inch main running from the 12
956 inch main on Broad Street and running out east and connected at each intersection with these four inch mains wherever it would cross them, wouldn't the four inch mains on the blocks just north and south of that ten inch main be perfectly available for at least a block?

A. For domestic purposes?

Q. Yes, and for any fires that might occur in that part of the town?

A. If the plug was situated on the main coming in from Broad Street, as I said, from the 12 inch main, and tied over here (indicating on map) with another main coming from the Rose Hill standpipe so that the water could circulate from Broad Street to 6th Avenue, you would get better service. I would like to state that this is just a mere opinion of mine. I am not versed in hydraulic engineering, just a private opinion of mine.

Q. Do you think the hydrant is rendered more effective by putting it on a ten inch main or by putting it a few feet off from the ten inch main on a four inch main?

A. I should think it would give better service on a ten inch main.

Q. Are not all the hydrants connected to a four inch pipe: Don't you in point of fact have to lay a piece of four inch pipe off from the main in order to get a pipe small enough to go into the hydant: Did you ever examine one of these hydrants?

A. I never heard of that before. I didn't know that was a fact.

Q. Don't you know that they are not fitted on to pipes larger than four inches?

A. I know that hydrants are connected to larger mains than 4 inches.

957 Q. Don't you have to use a piece of four inch pipe to make the connection?

A. Well, with the size of the hydrant right at the connection you might.

Q. You could not connect the hydrant directly on a 12 inch main?

A. No, sir; not without an opening to the hydrant—a connection.

Q. You would have to put in a piece of four inch main long enough to connect the hydrant with the main?

A. That's correct.

Q. Are the hydrants that they use here the best quality of fire hydrants?

A. Well, I have seen other hydrants that I thought would give more effective service. I don't know, as far as the material and construction of the hydrant are concerned; but I think the connections are far superior to these. I have examined them at conventions that I have been to, where they had separate steamer connections that did not interfere with the hose connections.

Q. Don't you know in point of fact in the City of New York that

they don't use hose connection at all, only steamer connections for fire purposes?

A. I have seen it that way; and I have seen some plugs not constructed that way.

Q. Isn't it so in New York because they don't dare to have the quantity of pressure that you say is desirable?

A. The pressure there is low.

Q. Isn't the pumping done by the engine?

A. At most of the fires, yes.

Objected to as not illustrating the issues in this case and objection overruled.

958 Q. In giving your opinion as to these streets to perfect this system and the use, as far as practicable, these four inch pipes, on how many streets would you place the ten inch mains, such as you spoke of as necessary?

A. I should think every two blocks would be sufficient for that size main, provided the pipe was tied in on the east side of the town with a 12 inch main, and a 12 inch main on the west side of town.

Q. You think that a 12 inch main on the east side of town, tied in with this cross-town 10 inch main, would you think that is necessary?

A. Yes, sir; provided we get the pressure to- from 17th Street. I am basing this on the idea that you get the water from the present pumping station as you do now.

Q. In other words: you are considering the present pumping station as the point of delivery?

A. Yes, sir.

Q. Now you want a main to control the Rose Hill standpipe, incidentally large enough for that purpose?

A. To get the full benefit of it.

Q. Down town: What size main in your judgment—I believe you said a 12 inch main on the east side of the city.

The MASTER: And one on the west with ten inch mains across town.

WITNESS: Tied in below 4th Street from Broad, on the west side of town, so that the water could pass clean around on both sides and across town.

Q. You think in that way that all the pipe system that now exists could be made available by these additional pipes being put

959 in that you suggest?

A. You mean the facilities would be greatly improved for fighting fire?

Q. Yes?

A. I should think they would.

Q. These four inch pipes that are in now would not be thrown away?

A. Only be used for domestic purposes on the Avenues and the cross streets would be the larger mains.

Q. Now Mr. Pearce, suppose you were to cover every—suppose you were to put a number of plugs on the larger mains, would it be

necessary to remove the plugs that were on the four inch mains if you had plenty of them on the larger mains: Couldn't they be used in an emergency in place of hose; and wouldn't it reduce the number of feet of hose that the city would have to carry?

A. That was my idea, to place the plugs as close to the larger mains as possible.

Q. As you could?

A. Yes, sir; as you could.

Q. Your idea is to run these 12 inch mains the length of the city and up to the Rose Hill standpipe and these cross town mains at every other block, the 10 inch, and place the plugs——

A. Between these two blocks with 8 inch—of course it would increase the efficiency; but the plugs you had between the two blocks would not give as good service as those on the other mains. That's the main trouble we have on the Avenues, the pipe is of so many different dimensions.

Q. In the lower part of the town?

A. You don't get good service from the large mains you
960 have because they are not tied in and of different sizes of pipe. You don't get the benefit of the larger mains that these smaller mains lead off from.

Q. You suggest that as a means by which these other pipes could be made available?

A. That's my idea, without taking them up.

Q. What effect did the turning in of the Eagle & Phenix pumps have: I will ask you first if you re-call the flooding of the Broad Street standpipe?

A. I remember it ran over on the occasion you speak of.

Q. What was the effect of turning in the Eagle & Phenix pumps?

A. Well, I don't know that they were ever turned on. I was not chief at the time. I was told that arrangements — made by the water works people with the Eagle & Phenix Co. by which they could use the pumps; but of my own knowledge I don't know anything about it. I don't know that it was ever run over by the Eagle & Phenix pumps.

Q. Don't you know a connection was made with the pipe on the street just below the engine house?

A. Not of my own knowledge. That's hearsay.

Q. Were you not connected with the fire department?

A. Assistant Chief, stationed at No. 4 engine house.

Q. Didn't you see them putting in the main leading down to the Eagle & Phenix?

A. I did not. I was told that was the case.

Q. Who told you?

A. Mr. Burrus.

Q. He was the chief of the department?

A. Yes, sir.

961 Q. You re-call the fact of the Broad Street standpipe running over about that time?

A. Yes, sir; I remember that.

Q. Are not these very powerful pumps of the Eagle & Phenix?

A. I have never seen them. I don't know the capacity of them.

Q. You know the firemen were cautioned about opening the valves whenever these Eagle & Phenix pumps were called into requisition in order to let it get the benefit of the air out of the top of the standpipe?

A. I don't know anything about that, sir. I was not chief at the time.

Q. The Columbus Iron Works fire: was the question asked you on yesterday as to the standpipe that belonge to the Columbus Iron Works that is across the street from the Iron Works, the standpipe in the block just north of the railroad street: Do you know where that standpipe is?

A. Yes, sir.

Q. Who owns that standpipe?

A. It is my understanding that it belongs to the Iron Works.

Q. Is it a fact that the Columbus Iron Works always maintained a separate fire department independent of the water works?

A. Never heard of such.

Q. Don't they have connections with this standpipe of their own?

A. Of my own knowledge I don't know.

Q. Wasn't that your information?

A. I have heard so.

Objected to.

962 Q. Didn't you find plugs down there in the Columbus Iron Works that were operated by pressure from their own standpipe?

A. I have seen plugs there but I did not know whether they were connected with their own standpipe or with the city mains.

Q. Wasn't that a part of the city that was comparatively very little supplied with fire plugs on account of this standpipe of the Columbus Iron Works?

A. I never heard of it.

Q. Did you hear anything about the fire plug down at the Columbus Iron Works that was discovered after the fire was over with a considerable length of hose attached to it that had not been used?

A. No, sir; I never heard anything about that at all. I read it in the newspaper of Mr. Springer's testimony here is the first I ever heard of it.

Q. You were not the chief of the fire department at that time?

A. No, sir; not in charge of that fire. I knew they had plugs there in the yard; but I did not know anything about——

Q. How many engines were out of repair at that time—fire engines?

A. Neither: We had three.

Q. Wasn't one of them an engine that you hadn't been using prior to that time?

A. No, sir.

Q. Very rarely?

A. No, sir; we had one engine in reserve at that time that was not brought into service at all fires.

Q. Didn't that engine break down?
A. About half past two in the morning.
Q. Didn't another engine break down?
963 A. It did about that time.
Q. You really had only one engine?
A. The fire commenced about seven o'clock and the engines did not break down until half past two in the morning.
Q. They were in full service up to that time?
A. They were except when we had to move one of them on account of scarcity of water.
Q. Wasn't one of those engines one that had been in use here for many years—in the city?
A. No, sir; it has had new pumps and been overhauled at one time.
Q. Where is that engine now. Is it fitted up?
A. No, sir; it is out of service at No. 4 engine house.
Q. Don't you think that engine needs a new engine to put it in repair?
A. At this time now you mean?
Q. Yes?

Objected to and objection sustained.

Q. That one that was broken down there, what do you think about that engine?
A. I think it should be replaced with a new one, I would like to state.
Mr. WIMBISH: Then or now?
WITNESS: Now.

Mr. WIMBISH: We object to it.
Objection overruled.

WITNESS: I would like to state the condition of that engine why it was out of service at the fire.
The MASTER: Explain your answer.
964 A. The reason the engine is condemned now is on account of the boiler. It has been in service for a long time and the boiler is not considered safe by experts. The machinery of that engine has been renewed within the last 7 or 8 years—practically the machinery part of it was renewed and the pumps were overhauled. The machinery and pumps are as serviceable now as they were sometime ago. It is the condition of the boil*d*er that is condemned. During the Iron Works Fire one of the pumps gave out on the engine. The machinery proper of the engine, all the old machinery has been torn out and duplicate parts put in.
Q. The other engine that broke down at that time, what has been done to that since?
A. That's the best engine we have. That was occasioned by the machinery or connections of the pumps getting out of order, which will happen to the best of engines sometimes at fires.
Q. Well, two of them were broken down at that fire?
A. They did.

Q. The engine will give you a larger number of streams?

A. To get the capacity of the mains and the pressure required at such fires, of course we would have to have it.

Q. What you mean, as I understand, is this: With an engine by the continued use of the water at any fire and the pressure dropped down, you would have your engine to commence restoring the pressure as soon as it began to drop down: that's what an engine is for?

A. That's one thing and when the fire gets to burning, on account of the heat, etc., we have to get away from it with the nozzle,
993 of course we have to have our steamers to give us pressure to throw the water on the fire; and also the more plugs opened that would diminish the pressure.

Q. In the system here, as it exists to-day in the city, it will furnish one or two good streams and maintain good pressure until you can get your engine started, steam up and under headway, after that the engine will give you the pressure, provided the mains are big enough to supply your engines?

A. That's correct.

Q. Mr. Pearce, the four inch mains run a good deal more water through them, where they are caught on or coupled up at enough places, than can go through the hose of an engine: what is the dimensions of the hose the engine draws its water through?

A. 2½ inches.

Q. The size of the stream varies as the square—a four inch pipe would deliver about 2½ times as much water as a 2½ inch hose could use, provided the four inch pipe was so coupled up with cross pipes so placed as would get the water into it?

A. If you can get the full capacity of a four inch pipe.

Q. The trouble with four inch mains is that it requires more frequent intervals of cross pipes in order to get its capacity?

A. The trouble with a four inch pipe for fire purposes, the diameter of the pipe is so small that the water can't pass through there fast enough to give you any pressure at the nozzle to cope with any fire even from the plug pressure, much less with a
994 steamer. I know that by personal observation.

Q. How many streams do you use when you are running your engines?

A. What is the capacity of our engines?

Q. Yes, how many streams can your engines supply when you are running all three—how many streams will each engine give you?

A. Never use over two. I have one engine with a coupli-g for three.

Q. With the steamer power of an ordinary engine, two streams is all that you can advantageously use?

A. That depends upon the size of the engine.

Q. I mean of the engines here as they are, two stream- is about the limit?

A. That's correct.

Q. Take the actual conditions as they exist, the kind of fuel you have to use in the engine, and things of that sort, frequently one stream you get better results from than two from an engine, can't you?

A. Yes, sir; according to the size of the nozzle we use.

Q. The larger the nozzle the fewer the streams?

A. The larger the opening in the hose of course that decreases—the larger the opening of the nozzle decreases the pressure you know.

Q. You can't get as many streams?

A. That's correct.

Q. The sizes of the pipe that you use the water from that is the 6, 8, 10 and 12 inch mains, the water only comes up through a four inch opening to get to the hose, does it not?

A. I think that's correct.

Q. Then it goes through a 2½ opening, the distance it has to traverse the hose: that's all the clearance you have in the hose?

A. Two and one half inches.

Q. Then with a one inch nozzle, why it has to go through
995 a space of one inch finally?

A. Nozzle, that's right.

Q. So really the loss, which is very small, is the amount of friction loss in the distance it has to travel from the time it gets into the main up to the time it gets into the fire hydrant?

A. Friction in the mains according to the diameter of the mains.

Q. If you had your four inch mains coupled up with cross-pipes at frequent enough intervals, why your four inch mains would give you a better stream of water than you could use in your hose, wouldn't it?

A. It would be according to how many hydrants are connected to that four inch main.

Q. If there was a plug at one corner and another plug at another corner and you had an engine on one corner and another engine on the other corner, on the same main, don't care how much you had it tied in, one engine would not get enough water, an engine of 600 gallons per minute? A four inch pipe gives you one good stream. More than that don't adequately supply your engine?

A. No, sir. I do get two streams from them sometimes, if there is no other drain on it—no other opening.

Q. You can get two good streams?

A. I can get small streams. Can't use my 1¼ inch stream.

Q. If you had four inch mains tied in frequently enough, you could get two perfectly good streams from a four inch main, couldn't you?

A. I think I could.

Q. In other words: the internal diameter of a four inch main is bigger really than the size of two 2½—the size of two streams: I mean just the entire space inside of one four inch main?

A. Yes, sir.

996 The MASTER: I believe you said you could get two good streams from a four inch main: That's about ordinarily what you call on from that main?

A. Yes, sir; that's correct.

Q. You explained about the dead ends, the loss of water from a

dead end: The water that comes into a pipe through a dead end, comes in from only one end?

A. That's correct.

Q. Where it is not dead end is where it is coupled up and draws water from both ends?

A. That's right.

Q. The same size pipe will deliver approximately twice as much water where it is coupled up at both ends as it will where one end is dead?

A. I don't think the proportion would be that great.

Q. It would be considerably greater?

A. It would be greater.

Q. What is the length of a block the long way and then the narrow way, of the different city blocks?

A. Well, I should say 400 feet: I am not conversant with that; and I think the average blocks, north and south, are 600 feet long.

Q. From center to center: Ordinarily it is best, is it not, if the fire companies will have it in mind and be careful and get a part of their streams from one main and then a part from another main: you don't have to get them from the same main?

A. No, sir.

Q. With the engines you have got and the kind of hose you use, it is practicable to use hose line of about how many feet: What is the ordinary working length?

A. That we average at a fire?

997 Q. Yes?

A. I should say 600 feet.

Q. You can use with the engine 1000 feet, can't you?

A. Yes, sir.

Q. With the avenues 300 feet apart and the mains on each Avenue, you can always so place your engines so as to get the fire streams from different mains, can't you, so as to fight the fire without having more than two streams from any one main?

A. That depends upon how the hose is laid. Whenever a company goes to a fire, they go to the closest plugs and they reel off the hose and if an engine goes up to a plug where the hose is laid, they have to wait for orders. By giving your orders you could always get them from different mains, if you have them in mind when you frame your orders. Some parts of the city I could do that.

Q. Is it not practicable all over the city: None of these Avenues are over 300 feet apart are they?

A. I can't say that positively.

Q. There are mains on each Avenue?

A. No, sir—yes, there are mains on each Avenues; but some Avenues have no plugs. Have not got any openings at all. For instance: you take 5th Avenue from 11th Street down to 4th Street, there is not but one plug.

Q. The remedy would be just to have more plugs so as to have plugs on every Avenue?

A. We could work it that way if there was a plug on the corner of each Avenue.

Q. So by having enough plugs you would not really get all the streams from any one main, would you? Say for instance a fire was here, you could go back 300 feet on that side and go to that
998 plug and go back 300 feet on the other side and get another plug? (Referring to map.)

A. How many streams did you say? One from each engine

Q. Two streams from each engine would be all you would need on any one line: One engine on this line, one on another and one here; and in that way you could use all three of the engines on different mains?

A. That would depend entirely on how these lines on the Avenues were tied in, the water that led to these four inch mains.

Q. If they were tied in with cross pipes that would be true, wouldn't it?

A. Well, if they were tied in the way I expressed it to-day, if the plugs were placed on the cross mains as close to these big mains as practicable, that can be done.

Q. You were asked about the St. Paul Church fire: Didn't you speak of two or three fires where there was a still alarm; and I understood you to say in reply to one of Mr. Wimbish's questions, that the purpose of notifying the water works company is to enable them to put on direct pressure: Isn't it a fact that even where they do not turn on direct pressure, that the working of the pumps increases the pressure throughout the whole system?

A. That is according to the location of the fire. If the fire is below 14th Street, the valve is turned on at the No. 1 engine house and it would. If it was not below 14th Street and the valve was not turned on it would not.

Q. You always try to turn it on at every fire?

A. We turn it on.

999 Q. Whenever you turn it on the working of the pumps increases the pressure throughout the system, even where you have——

A. (Interrupting.) You mean the pumps at the power house?

Q. Yes, where it pumps into the standpipe?

A. It increases the pressure until the standpipe gets full and then it will run over at the top.

Q. It enables you to keep the water you use at the fires from diminishing the quantity in the standpipe, one thing it does, does it not?

A. Yes, sir.

Q. Another thing it does: the power of the pumps is more really than the capacity of the pipes, isn't that true?

A. That's a fact.

Q. What I mean is this: with the full power of the pumps turned on, it does not only run the water up in the standpipe all the time, but it does increase the quantity of the pressure through ever- pipe that water has got to travel through in getting into the standpipe? The flow of water going to the standpipe in these mains?

A. Yes, sir; that increases the pressure.

Q. Increases it that way all over the city, doesn't it?

A. When the standpipe gets full about 80 or 90 pounds is about as much as they can get, because whenever—when the standpipe gets full it will run over the top and won't be any pressure on that.

Q. What I mean is this: I don't know that I make myself clear: Now let's see: where are these pumps?

A. These pumps are on 17th Street near the river.

1000 Q. Here are the pumps on 17th Street. (Referring to map.) Where is the standpipe?

A. On Rose Hill.

Q. When these pumps are working it not only forces the water through these intervening pipes up into the standpipe, but on account of the capacity of the pumps being bigger than the capacity of the pipes, it adds pressure to every part of the system: In other words: the surplus pressure of the pump is throughout the system, over and above what can be relieved by going into the standpipe—there is re-enforced pressure all *ob*er the city while the pump is working?

A. Y-s, if he has the valve turned on so it can get down town, it would increase it some, but not very much.

Q. Suppose the pump has got strong enough pressure to fill say a 16 inch pipe. Suppose the pipe that leads into the standpipe is not 16 inches but is only say 10 inches. Now then, all the excess of pressure represented by the power of the pump to fill a larger pipe than it has got to fill, has got to get relief somewhere, hasn't it: and doesn't it re-enforce the pressure throughout the whole system?

The MASTER: He answered that by saying to some extent.

Q. Isn't it a considerable extent? Did you ever notice that?

A. No, sir. The pressure will run into the Rose Hill standpipe and not having anything to hold the water down, it will rise up in there and whenever it gets to the top it will run over. If you could stop that water and pump direct into the mains, you could increase your pressure materially: but as to how much, I can't say.

1001 Q. What size pipe leads from the pump into the standpipe?

A. On Rose Hill?

Q. Yes?

A. Not certain, but I think it is an eight inch main.

Q. Into the standpipe; and this same size pump or engine only had to fill one six inch main, pumping as hard as it could, it could not put but half as much water in the standpipe, because say it has not got the pipe to carry it?

A. Could not put as much water, that's right.

Q. If this pump don't relieve itself by putting the water into the standpipe, don't it add that much to the pressure on the other pipes lower down in the city?

A. Yes, increases the pressure connected on to the pumps.

The MASTER: I understood the witness to say in answer to the hypothetical question put to him awhile ago that it increases it to some extent.

Q. It is getting in other words a combination of direct pressure and standpipe pressure, isn't it?

A. Well, the benefit, according to my judgment, would be some; but just how much it would be I am unable to say. I am not well enough up to say; but I believe it would be some. I may be wrong but I don't think, materially, it would add much benefit.

Q. You have never tested that to see?

A. No, sir; but I don't think materially there would be much benefit,—much difference.

Q. Depends of course upon the size and power of the pump as to how much difference there would be and the amount of
1002 water it would take to fill the standpipe—as compared with the amount of water it would take to fill the standpipe?

A. And the size of the mains.

Q. Who turns the pressure on from Rose Hill, an official of the city or an official of the water works company?

A. An official of the city.

Q. How does he know when to turn it on?

A. When an alarm is received there at the engine house.

Q. Received in what way?

A. Through the telephone or by fire alarm—telegraph alarm.

Q. If it was what you call a still alarm it would depend upon whether he would turn it on?

A. No, sir; it would depend upon whether it was below 14th Street.

Q. What I mean is this: unless he happened to be in touch with the telephone so as to hear the message, he might fail to turn it on at all, whereas, by sounding a gong he could always hear it and turn it on?

A. If he didn't get it and any one of the other companies were to get it, they would notify the companies to respond to the alarm and that's the way he would get it. He is there or a man takes his place day and night. Always a specified man up there to turn on the valve at all alarms below 14th Street before he goes out with the engine. He turns that valve on before he leaves the engine house with the engine. The engineer or stoker goes with the engine and he turns that valve on before he leaves the engine house with the engine.

1003 By the MASTER: How long has this still alarm system been in vogue, what you call the still alarm system?

WITNESS: Been here ever since we have had a telephone in the fire department. Anybody can send in a still alarm, the one he was speaking of; and we ring a gong at the engine house when the alarm is received. Always get a still alarm from the telephone. What we mean by a still alarm, you telephone from your house to the Central office, Telephone Exchange and they telephone to the fire department or you can telephone direct to the fire department before you pull the box on the street.

Q. I understand that's what is commonly called a still alarm; but you have what is called a signal still alarm: How long has that been in force?

A. We ring two taps of the bell now. That was put in in 1902.

(By Mr. WIMBERLY:)

Q. When you said in your direct examination about the Swift residence fire and the St. Paul Church fire and these others where you said there was a still alarm, you meant a telephone message, didn't you?

A. That's it.

Q. So in your testimony wherever you referred to a still alarm, you meant an alarm that you got notice of by telephone?

A. Yes, sir.

Q. You did not get notice in the regular way by turning in an alarm station?

A. That's correct.

Q. Then you sent it?

A. Yes, sir.

1004 Q. A telephone message means a loss of time?

A. No, sir; we can get out quicker by a telephone message than we can by a box alarm; because in a box alarm we have got to wait; because if it is a double box, there is an intermission between the strikes that has got to be counted.

Q. You have got to be counting when you are getting ready?

A. If we can't see the fire we go to a box and maybe the fire is a block off from the box. When a telephone message comes in the man who answers the telephone, you not only tell him the location of the fire, but you tell him exactly where the fire is; so our hose company responds directly to the fire.

Q. Where you have a telephone message that is not communicated to the engine house for them to start their pumps?

A. No engine responds to a telephone alarm until we get to the fire and telephone——

Q. The people at the water works engine house, when you get a still alarm they don't know anything about that fire at all?

A. They do now.

Q. I mean at the time of the St. Paul Church fire and the Swift fire and these others where they had a still alarm: Your telephone message came to the fire department and there was nothing to indicate to them that there was a fire, was there?

A. Not at the St. Paul Church fire. I don't think we struck two taps in 1901; but the valve was turned on in the engine house.

Q. In 1900 during the Swift fire, did you strike any taps then?

A. Don't think we did.

1005 Q. So the water works company were never notified of these fires so they could have a chance to start their pumps?

A. When the valve is turned on they notice the gauge.

Q. They would only notice it if they happened to see the gauge?

A. I don't think at those fires they got any direct notice.

Q. Whether he saw the gauge or not would depend upon whether he would happen to be watching the gauge at the time?

A. In a few minutes after the telephone message came in at both

fires, the street boxes were pulled and of course they knew it then because that brought out the steamers.

Q. How long afterwards, do you know?

A. At the St. Paul Church fire I ordered the steamer as soon as I got up there with the hose and saw I could not put it out with plug pressure.

Q. You lost the time of getting to the fire and trying the stream you had; and then afterwards sent a message?

A. Yes, sir; that much time was lost.

Redirect examination.

(By Mr. WIMBISH:)

Q. How many pipes are connected with the Pumping station and the Rose Hill standpipe?

A. I think, am not sure on that point, but I think it is an eight inch main running to the Rose Hill stand pipe. I will state that they have made a lot of necessary changes in the connections with the pumps, put in a 12 inch main. They run a 12 inch main to the pump where they used to have an eight inch main; and they
1006 have made some other changes there but I don't know exactly what they are. I don't remember.

Q. When they are pumping water into the standpipe, is that water pumped through any more of the mains except those that lead to the stand pipe?

A. My impression is that it does not, the way they work it now.

Q. If they were pumping into mains other than the standpipe mains, that would delay filling the standpipe?

A. Yes, sir; the water would circulate around town.

Q. Do they pump direct pressure into the mains: Is not the pressure obtained by pumping into the standpipe?

A. That's the way it is obtained. That the way Mr. Preer told me.

Q. Regardless of the size of the main and the power of the pump?

A. Yes, sir.

Recross-examination.

(By Mr. WIMBERLY:)

Q. I will try and make myself clear: As I understand it, here is the 17th Street pu. ing station? (Illustrating.)

A. Yes, sir.

Q. Now then here is one of the pipes, a six inch main leading from the pumping station up to the Rose Hill standpipe: that's right?

A. Well, I don't know about the size of those mains. They have made some changes there that I am not conversant with.

Q. That's the direction?

A. That's the way they go—that's the way the pipe leads up there.

Q. Then on the other side, so as to get the water into that standpipe from two directions at once, there is another six inch pipe that

comes up this way and comes down on 21st Street and then
1007 comes down Hamilton Avenue so that it pumps water around through two pipes into the standpipe, isn't that right?

A. If they have got two six inch mains that's correct.

Q. That is your understand- of it?

A. As I said; I thought they pumped into an eight inch main into the standpipe on Rose Hill.

Q. Now Mr. Pearce, when you start your pump, the pump throws the pressure into these mains and the only outlet for that pressure is by the opening into the standpipe, which lets the water rise up in the standpipe: that's true?

A. That's correct.

Q. Now while that water is carried up to the standpipe, the standpipe pressure that comes down to the city has got to come through that same main, the same main that the pump is pumping into?

A. Comes out of the same they pump into. I don't know whether they have got another main that leads off from that point or not.

Q. There is not but one main that leads down to the city from the standpipe?

A. May be others. I don't know.

Q. You know it is a fact: Don't you remember Mr. Wimbish's question: You didn't seem to get it clear that the water is coming down the same main from the standpipe to the city that has got to be pumped through from the pump into the standpipe?

A. I don't know of my own knowledge that that is a fact. Could be another pipe connected on to that same pipe and come down.

Q. Of course that could be a fact; but that is the only way it has to come?

1008 A. To the best of my knowledge and belief that's the way. I don't know.

Q. With the pump working throwing water into the mains and the power of the pump is greater than they can use, it increases the pressure on the main that the water is forced through?

A. Yes, increases the pressure when you pump into the main.

Q. And whatever pressure is not relieved by going into that standpipe, most of it would be direct pressure on the main?

A. You mean when you pump into the Rose Hill standpipe direct, that increases the pressure down town to some extent?

Q. It increases the pressure on that pipe and therefore every other pipe that communicates with it?

A. To some extent I would say it would.

Q. Suppose that valve were entirely closed, that pipe leading out there, (indicating), then you would have entire direct pressure?

A. It would down town.

Q. Suppose you would half close that valve but not entirely close it, but half close it and your pump would go with the same power as if it was entirely open, then all the power of the pump that was not relieved by the valve being half open, one third or one tenth would be direct pressure on the pipe?

A. Yes, would increase the pressure.

Q. Suppose it was nine tenths closed, the valve, nine tenths of the power of the pump would be direct pressure, wouldn't it?

A. It would not increase it as much if the valve was closed, because it would relieve itself into the standpipe.

1009 Q. Suppose you half close it, then the other half would go as direct pressure?

A. That would——

Q. Suppose you three fourths close it, the valve leading into the standpipe so that only one fourth of the water could get an outlet through the valve, the other three fourths of the pressure of the pumps, going as fast as they could, would be direct pressure, wouldn't it? You wouldn't get the relief by reason of the valve not being open wide enough, would have to expend itself in direct pressure, wouldn't it?

A. Yes, sir; I think it would.

Q. Suppose, for instance, instead of being a six inch pipe, they had three pipe- in there and you were running the same size pump, a large part of the power of the pump would have to go to direct pressure? wouldn't it?

A. If the pump was connected on to the whole circuit—the main system down town.

Q. That is necessary, for the only water that can get down town from that standpipe has got to go through the same pipe that leads up from the pumping station to the standpipe?

A. You have got an opening in the standpipe which relieves the pressure all the time. Not like pumping direct into the mains.

Q. As far as it does not relieve it, it goes to direct pressure, don't it?

A. Yes, it would increase the pressure; but how much I can't say.

(By Mr. WIMBISH:)

Q. The pipe leading from the pump to the standpipe, can you force any more pressure through that pipe than it can stand without breaking the pipe?

A. No, sir.

1010 Q. Can you go beyond its capacity?

A. No, sir; you can't put any more water through the pipe than it will stand.

Q. Is it possible to carry any surplus pressure through a pipe, from one to another, beyond its capacity?

A. Put that question again.

Q. I say is it possible to carry from one point to another through a pipe, any greater pressure than the capacity of the pipe will stand?

A. No, sir.

Q. Do I understand that the water that goes from the pumping station to the Rose Hill standpipe comes back to the city through the same pipe?

A. Well, that's a point I am not familiar with.

Q. Would it be possible for water to flow in both directions at the same time?

Mr. WIMBERLY: It does do it.

Mr. WIMBISH: You need not answer it any further. Counsel has answered it for you.

Q. You say that the number of fires up to September, 1901, I believe, at which you used the engine, was one: what per centage of the fires did you use the water works water, fire alarms: How many were put out by the chemical engine or by buckets?

A. A large per centage of my fires are put out with the small chemical engine, buckets, etc.

Q. What per centage: ninety per cent. of the alarms?

A. Which year did you say, 1901?

Q. January, 1901, to January, 1902?

A. No, I don't think it is quite that much. I would say seventy five per cent.

1011 Q. Are you familiar with the loss occasioned by the Columbus Iron Works fire?

A. Well, to the best of my recollection the books and records show that it was a hundred and thirty odd thousand dollars.

Q. Ain't you mistaken about that? Wasn't it more than that?

A. Three hundred thousand. That was the actual insurance loss. The loss of property and goods was three hundred and some odd thousand.

Q. Three hundred and some odd thousand dollars?

A. Yes, sir.

Q. I will ask you about the fire that destroyed the girls' public school: How much property was lost in that fire?

A. Burned up 10 houses on 5th Avenue and the girls' public school.

Q. What would you say was the approximate property loss?

A. I suppose the houses along at that time were worth forty thousand dollars, I suppose.

Q. Would you call that fire a pretty big fire for Columbus?

A. Yes, sir; a pretty good fire. The public schools, I didn't figure that in.

Q. Now Mr. Pearce, if there were angles in the supply main occasioned by the changing of the route up to the Central Railroad bridge and across and back to the pumping station, if they reduced the pressure from the reservoir on the supply mains and the water was then pumped into the standpipes, would those angles have any effect on the pressure on the distribution mains?

A. The mains that were pumped into from the pump—the mains leading from the pump?

Q. No, I mean after the water gets into the standpipe, if
1012 you are going to consider the pressure from the Rose Hill standpipe to the down town portion of the distribution system, would the few angles in the supply pipe affect that?

A. No, that would not affect it at all. When it got up here, the pump would supply from there on.

Q. And the standpipe would supply the pressure?

A. That's what I mean. Take the water to the standpipe.

Q. The angles in the supply main would not affect the pressure of the water after it comes out of the standpipe?

A. No, sir.

Q. State what, in your opinion, is the cause of the sudden lowering of pressure, as recorded at the various times that have been cited you by counsel, whether it was due to temporary accidental causes or to the insufficient sizes of the mains?

A. It was produced on account of the size of the mains and the sudden draught on the mains, in my opinion, as I said from the railroad out here and the Southern Ry. shop and other plants around town. Whenever they draw on them, open up a 2½ inch stream to fill up their engines or for whatever might be the draught, that brings the pressure down; or if you draw on it from other sources too, for fire purposes, that would bring it down lower.

Q. If the mains were sufficiently large would these size streams reduce the pressure?

A. No, sir.

Q. Suppose you were to have a fire at the time of this low pressure, as indicated by these records, what would be the effect of your inability to get water?

A. Well, of course whatever the pressure was, it would decrease my efficiency that much. You know what I mean by that.

1013 If the pressure was low at the time I was drawing on it, at the same time, I would not get much service out of the mains.

Q. What service would you get from ten pounds pressure?

A. I would not get any at all. I would not consider that any pressure.

Q. What would you get with twenty pounds pressure?

A. That would depend on the amount of hose and the size nozzle I used. You could not fight a fire effectively with 20 pounds of pressure. You could not take 20 pounds of pressure and get up on a two story house and fight it.

(By Mr. WIMBERLY:)

Q. You told Mr. Wimbish that it was not possible to put a greater pressure on a pipe than its capacity would stand without breaking it: do you know how much these cast iron pipe will stand in the way of pressure without breaking—what they are tested to?

A. No, sir I do not.

Q. Isn't it 300 pounds?

A. Well, I don't know. I never heard.

Q. You have never known any of that pipe to break from overpressure?

A. No, sir.

Q. The estimate that you gave of the ten houses and the school: was there any one of those houses that would cost to build them over a couple of thousand or $2500?

A. Well, I think that would depend upon—yes, I think there was. Mr. Phillips had some houses—one houses that would cost possibly more than that.

Q. Not taking the value of the ground, but the houses
1014 themselves, average them through, how much would those ten houses cost?

A. I had stated to the other party $4000.

Q. Wouldn't you think that was two or three times what they were worth?

A. I was including the ground and all.

Q. Taking the houses alone without the ground, what would you say those houses were worth?

A. It had sorter passed out of my mind. I know one of them was a one story house.

Q. Average them at $1200 or $1500?

A. Cost more than that.

Q. How much would you put the ten at?

A. I should say, averaging them, I should say $3000 or $2500.

Q. And the school house, was that a frame building?

A. That was a frame building.

Q. That was not worth over $3000 or $4000, would you say?

A. That was a pretty large building—double building there.

Q. Wasn't an especially expensive building, was it?

A. No, sir.

Q. Not many extra trimmings or architectual corners to run up the expense: What would you say that building would be worth?

A. Rough estimate I should say $5000.

Q. $25,000 would cover that fire, wouldn't it?

A. Well, I could not say. I don't remember the construction of them. I know there were some nice houses along there and some I know were nicely constructed.

Q. You spoke of the angles in the supply main not affecting
1015 the pressure in the distribution mains: it would increase the difficulty of keeping the standpipe full?

Objected to as not being in rebuttal and objection sustained.

Court here took a recess until Monday Morning, Feb'y 29, 1904.

MONDAY MORNING, *February* 29, 1904.

Court met pursuant to recess and the hearing was resumed.

FREDERICK M. COLSTON, sworn by the complainant, testified as follows:

(By Mr. WIMBERLY:)

(This witness was allowed to testify at this juncture by agreement among counsel in the case.)

Q. You are the F. M. Colston who is the chairman of the Bondholders' Committee of the Columbus Water Works Co.?

A. Yes, sir.

Q. Who are the other members of the bondholders' committee?

A. Julian T. Burke, John A. Whitridge, Nathaniel W. James and Miles White, Jr.

Q. How many bonds of the Columbus Water Works Co. are outstanding?

A. $392,000.

Q. Of that $392,000 bonds of the Columbus Water Works Co. outstanding, how many are deposited with the bondholders' committee?

A. $386,000.

Q. Leaving outstanding not in your hands?

1016 A. Six thousand, of which we have a trace of five, which owing to very peculiar circumstances can not be deposited with us and one we have been unable to trace. One thousand only we have been unable to trace.

Q. You can't find where that thousand now is?

A. No, sir.

Q. Have you amongst your papers as a member of that committee a list of the present bondholders?

A. I have, sir.

Q. Who have deposited their bonds with you?

A. I have, sir. Shall I read it.

Mr. WIMBERLY: I suppose we can file it as a part of his testimony and save the trouble of reading it?

WITNESS: I will read a few of the names: (Reading) "Peabody Fire Insurance Co. of Baltimore. Safe Deposit & Trust Company of Baltimore. That is the largest holding, $28,000. we have. J. T. Burke, *et al.*, Trustee, $20,000; Thomas Fairfax, Executor; General Joseph L. Brent; Hon. J.Wirt Randall——

The MASTER: I don't see the necessity of reading these if you are going to identify that paper and introduce it: Do you propose to offer that paper later?

Mr. WIMBERLY: Yes, sir.

(See page 348, Vol. 1 for list of bondholders.)

Q. Is that a correct list?

A. Yes, sir.

Q. Without any minute detail, can you state generally what is the residence of these bondholders: Do they reside in Georgia or other states?

A. Their residences generally are in the State of Maryland, Virginia, Mass., New York, and so on.

1017 Q. You made the original sale, did you, of the bonds of the Columbus Water Works Co.?

A. Yes, sir.

Q. Are these the original purchasers or are they people who from time to time bought these bonds in the open market?

A. A large majority of them are the original purchasers. The changes have been made in case of death and changes of estates, etc.

Q. A great many of them are still held by the original purchasers?

A. A very large majority.

Q. I will get you to go back now to the original—to the time of the original placing of these bonds?

A. On the 7th of October, 1890, I received a letter from Mr.

Samuel Spencer, dated October 6, 1890, from New York. Mr. Spencer was a personal friend of mine and had been president of the Baltimore & Ohio Rd. and very highly respected and regarded in Baltimore. Shall I read this letter.

Mr. WIMBISH: We will object to the letter being read.

WITNESS: I will say that I have cut out of that paper something which referred to the price at which the bonds could be purchased by us, for the reason that this letter was used in making sales. Of course you can understand the price at which we bought is a confidential matter. I will supply it. The figure or cut out part is "90."

Q. That's when you exhibited that to the prospective purchase-s?

A. No man is going to pay par for a bond when we buy at ninety.

Q. What did you do after the reception of that letter?

1018 A. We engaged Mr. Wrenshall, an engineer, whose services we had employed on other occasions, to come to Columbus. I spent, I think, four days in Columbus.

Q. You yourself?

A. Yes, sir; with Mr. Wrenshall.

Q. Who was Mr. Wrenshall?

A. Mr. Wrenshall is a civil engineer. He is well known to a mass of people in Georgia. He is a civil engineer of very decided standing and character.

Q. State what you did?

A. Mr. Wrenshall examined the physical part of the plant and I examined the accounts of the company in the office. I took off myself with a pencil and paper a list of every consumer and added it up. I took off the amount of expenditures. I determined from that that the company had a sufficient income to pay the interest upon the proposed $329,000. of bonds and allow a sufficient margin for the necessary extensions and improvements. I wish to state here that I have negotiated or my firm has negotiated bonds of about 30 water companies in the United States, from New York to Mississippi and from Nebraska to Georgia. I am at present president of the Oskaloosa, Iowa, Water Company. I am the vice president of the Topeka, Kansas Water Company. I am a director in the Omaha Water Co., which, I believe, is the largest private water company in the United States; and I am a director in the Kansas City Water Co. After my examination of the accounts, I read over very carefully the contract between the city and the water company; and having already had large experience in dealing with water companies, I read it with a great deal of care. There were three provisions in the contract

1019 that struck me: one that the city was willing to accept the coupons of the water bonds in payment of the hydrant rental. That was unusual. The second was the provision that the city could at any time acquire municipal ownership by a procedure which was entirely fair to the city and to the company. That is an unusual thing in water contracts. The third was the manner of determining whether the provisions of the contract had not been properly exercised by the company and that was also fair to the company and fair to the city.

Q. What effect had these three provisions on the sale of the bonds?

A. They had an undoubted effect upon me in purchasing the bonds—in making the purchase. I would not have purchased the bonds but for the contract. We have turned down a great many water companies because the contract with the city was not one that was fair to the company or enforceable.

Q. After you examined the plant and the income, the producing power and the operating expenses, with the assistance of this expert that you brought down here, what did you do?

A. We entered into the contract for the $392,000. of bonds at the price of 90.

Q. You say you were down here four days?

A. Yes, as well as I can recollect four days.

Q. Did you make inquiries and meet the citizens?

A. I did, sir.

Q. Did you investigate as to how the water works was regarded?

A. I went around and talked to several bank presidents and talked to the then Mayor. I heard no complaint of the service or
1020 the water.

Q. What was the condition in which you found the system at that time as to efficiency and satisfactoriness?

A. There are three salient points in water works bonds. The first is, of course, the ability to earn the interest upon its bonds. That is the financial part. That is my business. The second is the legality of all the contracts or ordinances. That's the lawyer's part. The third is the physical part: that is the engineer's part. I am no engineer or a lawyer. I turn those over to people employed for that purpose. I stated that we employed Mr. Wrenshall and brought him here for that purpose.

Q. He looked after the engineer's part?

A. Yes, sir.

Q. What was the result of his investigation?

A. The result of his investigation was satisfactory; so we concluded to purchase. Naturally did not conclude to purchase until his report was made.

Q. You also say you employed lawyers to investigate?

A. We submitted that to Major Venable.

Q. Major Venable?

A. Yes, sir; certainly one of the heads of the Baltimore Bar. Here is his letter dated January 28, 1891. Signed: Venable & Packard.

Q. That acted upon by the purchasers of the bonds?

A. Undoubtedly.

Q. Relied upon?

A. Yes, sir. We would not have bought them without it. That letter was shown to the purchasers too.

Q. You stated how that firm stands at the Baltimore Bar?
1021 A. I suppose these lawyers down here know Major Venable. He is one of the finest constitutional lawyers in the United States. He is at the head of the Baltimore Bar.

Q. He is a member of the firm that investigated that?

A. That firm is now dissolved.

Q. Now you can proceed as to what occurred after you made this investigation?

A. Everything then being satisfactory, we proceeded to offer the

onds for sale to our customers. The first sales were made De-
ember 29, 1890; and the bonds were all sold by January 30, 1891.
Q. Within——
A. One month.
Q. Within that period of time?
A. One month.
Q. What were the prices at which they were sold?
A. They were sold at par.
Q. And paid for by the purchasers in actual money?
A. Actual money; no discounts. No trades that I remember. In act I think these were the easiest water bonds to sell that we ever old in our experience. I have been a member of the firm of Wil-on, Colston & Co. for 37 years.
Q. Now the purchase was first by your firm and then you sold hem to your customers?
A. Yes, sir. We, as is usual in such cases, exhibited to such cus-omers as desired to see the contract with the city and Venable & Packard's opinion as to the legality of all the proceedings connected ith it.

Q. I will ask you also if the purchasers were informed as
022 to the earning capacity, expenses and the engineer's report as to the physical condition of the plant?

A. I think we had a letter from Mr. Epping which gives a whole ccount of the condition of the water company. I have not the riginal; but I will testify that this is a copy (Referring to paper in and).
Q. That's what was actually exhibited?
A. Actually exhibited.
Q. To the different purchasers from you?
A. Yes, sir.
Q. Why were these different copies printed?

(It was agreed to use a copy of letter from H. H. Epping, as Presi-dent of the Columbus Water Works Co., dated Jan'y. 27, 1891. See page 355, Vol. 1).

A. They were distributed and given to each bondholder as evi-dence on which he purchased his bonds.
Q. You say the contract and also the opinion of your lawyer were exhibited too?
A. Yes, sir; and referred to in the printed paper.
Q. In the printed circular?
A. Yes, sir. I may say here that my examination of the income of the company developed that it had a greater income at that time than Mr. Epping stated.
Q. That was your own personal examination?
A. Yes, sir; my own personal examination. I spent two days on it. Took two long days of hard work. Took it from their books and added up the whole.
Q. What other information did you have besides what you have stated, if any, that you gave to the purchaser and upon which he relied?

A. The purchaser relied solely, beyond question upon what I have stated to you.

1023 Objected to and objection sustained.

Q. Is there anything else than what you have specified that was brought to the attention of the purchasers of these bonds: I will ask you whether there was any other information given to the purchasers besides these facts you have stated?

A. The general information that water bonds constituted one of the best classes of corporate security in the United States; and that we had sold a good many with great success to the buyers.

Q. From whom did the purchasers of these bonds obtain their information as to what the system was and what the contract was and as to what they were buying?

A. From us.

Q. You have already stated what that information was?

A. Yes, sir. I may say here that many of these customers were personally acquainted with Mr. Spencer, of course. Personal acquaintance with him, his long residence in Baltimore and his intimacy with several capitalist- who purchased bonds, naturally had much influence upon them.

Q. After this first sale of $325000. of bonds, were any other bonds of the Columbus Water Works Company, under this mortgage, offered for sale and sold?

A. My recollection is that the first sales were made to put up the Rose Hill standpipe. Not positive.

Q. The first subsequent sales?

A. Yes, sir; the subsequent sales; but the attack of the city upon the validity of the contract, and especially their efforts to put

1024 a municipal water plant here through the voters of the city, naturally affected the credit of the company. The bondholders themselves agreed to take enough bonds to make that improvement and did so unwillingly, I suppose, but did so to protect their interest.

The MASTER: You asked the witnesses if there were any other sales?

Mr. WIMBERLY: Yes, sir.

The MASTER: He does not answer that question directly; but says the bondholders took certain bonds.

WITNESS: They bought them.

The MASTER: You mean to say those were the only sales subsequently made?

WITNESS: They were the only sales, such as passed from hand to hand in the ordinary course of business, but not from the water company.

Q. At what price were these sold to the original bondholders?

A. At ninety.

Q. These subsequent sales?

A. Yes, sir.

Q. What amount was sold at that time, at the time of the Rose Hill Annex?

A. I have no record of that. It was sufficient to pay for the erection of the Rose Hill standpipe and the connections with it and the improvements then made.

Q. You say you are familiar with this class of security, water bonds; that you have been handling them for about thirty companies. Are you familiar enough with the market of such security to state what market existed for these bonds prior to this action of the city that you speak of, questioning the validity of the contract and calling an election for municipal ownership?

1025

A. I am a sufficient business man to say that there would have been no difficulty whatever in disposing of any quantity of these bonds at par, if the opposition of the city had not developed.

Q. What was the effect of that opposition on the ability of the company to sell bonds?

A. It deprived us of the opportunity of offering them to the public, as we could not do so without a statement of the hostility of the city or the opposition of the city and consequently our market was then confined to the then investors.

Q. Those who already had their money in it?

A. Yes, sir; those already in. In 1895 the authorities of the water company came to Baltimore; and we called a meeting of the bondholders; and at that meeting the authorities of the water company stated while the income, the net income from the city was sufficient to pay the six per cent. upon the bonds, it was not sufficient to pay that income and allow the necessary amount for extensions and improvements which are continually demanded in a growing city. The bondholders unanimously accepted a reduction of five per cent. on their bonds—from six to five per cent. for three years, during which time it was supposed that the increase in the net income would be sufficient to put the company in condition to pay the full six per cent. But on July 5, 1898, the three years having expired or about to expire, there was another meeting of the bondholders and they unanimously agreed to accept five per cent. to the maturity of the bonds in order that the additional net income might be applied to the improvement and extension of the works.

1026

Q. Why was it necessary to make these extensions and improvements out of the net income and not out of the additional bonds that were reserved for that purpose?

A. Simply because the market for the bonds had been destroyed to a greater or less extent. The general market for the bonds had undoubtedly been destroyed.

Q. By what facts?

A. By the action of the city. I speak of the general market of course.

Q. What do you mean by the general market?

A. I mean applying to new people with a statement of the conditions surrounding it.

Q. The people who purchased had already invested?

A. Yes, sir.
Q. To save their investment?
A. Yes, sir.
Q. What complaints, if any, were made to the bondholders or their representatives by the municipal authorities during this time of municipal action as to any deficiencies?

Objected to on the ground that the city is not under any obligation to make any complaint to the bondholders; and is not admissible.

The MASTER: It seems to me that he can ask the question now; but as to whether there is any legal obligation upon the city
1027 to make these complaints, that is another question. If there was none then this evidence goes out.

WITNESS: None whatever. No communication ever received from them.

Q. Without any such complaints, what did the bondholders of their own motion looking to the betterment and extension of the system?
A. Through their representative, Wilson, Colston & Co., we were in constant communication with the officers of the company. Received regular accounts from them of the income and expenditure and what was necessary to be done. We have numerous letters on that subject.
Q. What did you do upon the information furnished as to what was needed to be done?
A. As I have already testified, we made arrangements by which the bondholders, when the income of the company was not sufficient, took the bonds in order to provide funds for that necessary improvement.
Q. And then you have spoken of the reduction of interest looking to the same thing?
A. Followed by the reduction of interest to accomplish the same object.
Q. Coming now to 1902, what occurred in that year?
A. We heard of the drought in 1902, but of course we could do nothing. If the coupons which fell due had not been paid, then the situation would have been immediately changed; but the coupons due July, 1902, were duly paid; so that the bondholders had no excuse for doing anything. But in the Fall of 1902, before the
1028 bonds were legally in default, the company, through its stockholders, consented to the receivership in order that proper measures might be taken for the rehabilitation of the works. We had Mr. Boardman to examine the works in behalf of the bondholders, Mr. Boardman being the manager of the Macon Waterworks and a water engineer of large experience. The company employed Mr. Ledeaux, of the American Pipe Mfg. Co., of Philadelphia. Both of these engineers agreed in the main on the plan proposed for the rehabilitation of the works; and to provide a supply that would not fail even with the same or a greater drought; and

both of these engineers agreed to provide means necessary to accomplish that by the issuance of receiver's certificates.

Q. Who was Mr. Ledeaux acting for in making such an agreement?

A. He was acting for the American Pipe Mfg. Co.

Q. He is an official of that company?

A. Yes, sir. That is a company that is largely engaged in the building of waterworks all over the United States. They are at present engaged in building a system of water works for the City of Charleston, S. C.

The MASTER: Did you say he was employed by the Pipe Company or this water company?

A. He was employed by the water company.

(The MASTER:)

Q. In connection with Mr. Boardman, who represented the bondholders?

A. Independently. We employed Mr. Boardman.

Q. Did they employ Mr. Ledeaux as a private individual or did you go to him as a representative officer of the pipe company?

1029 A. He was gone to of course as the agent of the pipe company.

Objected to that question because witness stated that Mr. Ledeaux represented the water company.

WITNESS: The idea was to have two independent engineers of very considerable reputation and standing to report independently.

The MASTER: What was the question?

Mr. WIMBERLY: I wanted to ask him if that agreement was made as an individual or in behalf of the company he represented.

The MASTER: If this witness knows that to be a fact it would be admissible to ask him.

Q. Was Mr. Ledeaux employed as a private individual?

A. Yes, sir.

Objected to on the ground that the witness is not a member of the water company and his testimony as to how Mr. Ledeaux was employed is necessarily hearsay.

Q. How do you know how Mr. Ledeaux was employed?

A. I went to Philadelphia as a member of the water committee and interviewed Mr. Ledeaux in his office on the subject.

Q. Were you present when he was employed?

A. No, not present when he was employed; but I interviewed him afterwards as a member of the water committee—water bondholders' committee. Interviewed Mr. Ledeaux in his own office in Philadelphia.

Objected to on the ground that his testimony as to how

1030 Mr. Ledeaux was employed is hearsay.

WITNESS: I got the information from the water company that Mr. Ledeaux had been employed and I went to Mr. Ledeaux to

learn personally what his opinion of it was, what he could do, what the cost would be and how the cost could be provided. The committee went to Philadelphia for that purpose.

Q. Why did you go to him?

A. Simply to be posted on everything in regard to it. We had Mr. Boardman's opinion already and his estimate and we wanted to get Mr. Ledeaux's. We had about $400,000 involved in this and our honor too as bankers.

Q. Mr. Colston, you spoke of this receivership here: What facts or previous action or conduct rendered the appointment of a receiver necessary?

A. For the reason that the action of the city and the condition of the water company prevented any other sales of bonds or any other means providing for the improvement and extension of the same other than the issuance of receiver's certificates.

Q. Were there bonds on hand that could have been used but for the destruction of credit you have already spoken of by the action of the city?

A. In issuing water bonds, it is absolutely necessary that the credit shall be what we call an open one and not a closed one and consequently this mortgage was made for $500,000. There was at that time over $100,000 of bonds in the treasury of the company which would have been under ordinary circumstances available for that purpose.

1031 Q. What prevented that money from being available in 1902?

A. The action of the city and the effect of the drought.

Q. In addition to the action of the city that you have spoken of, what action, if any, did the city take in 1902, that affected it?

A. They applied to the Legislature for authority to issue bonds to build a municipal plant and entered upon proceedings necessary thereto.

Q. What, if anything, did they do in regard to the payment of water rentals?

A. They declined to pay the water rent which was due on July 1, 1902.

Q. Now what was the effect of those acts on the part of the city in the year 1902 upon the ability of the water company to float its bonds and make these improvements.

Objected to as irrelevant, immaterial and a matter of argument.

(By the MASTER:)

Q. Did you make any sale of any of these bonds after these acts you have detailed here by the city were done?

A. I don't remember any sales of them.

Q. Did you make any effort to sell any?

A. I can't remember any effort; simply because we don't try the impossible. I will state as a positive fact, that notwithstanding the drought in 1902, that we could have sold bonds of the Columbus Water Works Company to have made the additions if the city had not taken the position or the steps it had.

Objected to as a conclusion.

1032 The MASTER: I will consider that statement in connection with his answer to my questions.

(By Mr. WIMBERLY:)

Q. State your reasons?

A. After 37 years of experience, sometimes our opinions are founded on facts. We have been through that with other companies in the same way, droughts, dams and reservoirs.

Q. That's on another matter: Do you know anything about the firm of Wilson & Adams, predecessors of Wilson, Colston & Co.?

A. The firm of William Wilson & Sons was established in Baltimore in 1802. The firm of Wilson, Colston & Co., took my name in in 1867. Those were the two firms for 102 years in Baltimore.

Q. I will ask you if there was any such firm as Wilson & Adams?

A. I never heard of them.

Q. I will ask you if Wilson, Colston & Co. had any predecessors by the name of Wilson & Adams?

A. Never.

Q. Mr. Pierson, I believe, claims to have had some negotiations with Wilson & Adams: Did you have any such negotiations or know of any with him?

A. Never heard of Mr. Pierson at all. I have read his affidavit. We never offered the bonds to Coffin & Stanton and had no communication whatever with them. I have testified that we sold the whole issue in connection with Browne & Lowndes, who are our agents and sold the whole issue within 30 days; and it was not necessary to get any outside aid.

Q. You never had any communication with Coffin & Stanton?

A. I never heard that Mr. Pierson was here when I was here. He claims to have been here in October, 1890. I never heard of
1033 him. He claims to have had communications with Mr. White and others. As I recollect it Mr. White was then entirely out of the matter.

Q. Who is Mr. Pierson, do you know him?

A. I don't know him at all, sir. I know the firm of Coffin & Stanton, to my sorrow.

Objected to latter part of answer and objection sustained.

Q. Who were they, Coffin & Stanton?

A. They were bankers in New York; and after an experience of comparatively a few years they failed most disastrously.

Q. Mr. Colston, there has been something referred to or read from affidavits, about certain property known as the Blue Springs: Do you know anything about who it is that is trying to sell the Blue Springs?

Objected to as irrelevant and immaterial.

Objection withdrawn.

The MASTER: Do you insist on that question?

Mr. WIMBERLY: I reckon at this stage it would not be admissible.

Q. You have seen this amendment to the bill?

A. You mean the bill of the complainants?

Q. The amendment that contains the language set out in Judge Newman's opinion?

A. Yes, sir.

Q. I will ask you if that is true?

A. Yes, sir.

(Referring to page 6 of the printed copy of the opinion of Judge Newman.)

Q. They have authorized the committee to make that offer to the court?

A. Yes, sir.

1034 Q. And the committee has made that offer?

A. Yes, sir.

Cross-examination.

(By Mr. WIMBISH:)

Q. When you were here in 1890 for the purpose of investigating the conditions, did you see the books of the company?

A. I did, sir.

Q. In whose possession were they?

A. They were in the possession—I think Mr. Epping showed them to me.

Q. How far back were those books kept?

A. I only went through the income accounts for the last year.

Q. Did you see the other books in the office?

A. No, sir; I had nothing to do with them.

Q. So you only went through the income account of one year?

A. Yes, sir.

Q. What year was that

A. That was the year previous to '90.

Q. 1889?

A. Yes, sir. That is, the current income: We took, for instance 1st of July or the 1st of October, whatever period was determined upon and took what the actual income was at that time and the actual operating expenses as a basis and determined the net income of the company.

Q. Did you verify these statements that were furnished you by Mr. Epping?

A. We did. I have already testified, my recollection is that the actual income was greater than Mr. Epping stated, $1000, something like that.

Q. Did you examine the extent of the water shed?

A. I have already testified that I am not an engineer.

1035 Q. Did you go over there and look at it?

A. Yes, sir; drove over there to the reservoirs.

Q. Did you look to their title to see how many acres they had?

A. I did not, sir.

Q. You relied upon the information of Mr. Epping?

A. I relied upon the information of the president of the company.

Q. Who was that, Mr. Epping?

A. Mr. Epping.

Q. Do you remember how many acres?
A. I don't know, sir.
Q. That he stated the watershed contained?
A. No, sir.
Q. Did you see the reservoirs?
A. I did.
Q. What was the capacity of those reservoirs?
A. I don't know, sir.
Q. You have had experience in water companies and you doubtless have seen a great many reservoirs; and you can get a pretty intelligent general idea of the capacity of a reservoir?
A. Yes, sir.
Q. What in your opinion was the apparent capacity of those reservoirs?
A. The apparent capacity of those reservoirs was, that it was sufficient to supply the City of Columbus.
Q. I would much prefer that you answer my question in gallons?
A. You asked me the apparent capacity and I answered it, I thought.
Q. Whether it was sufficient for the city of Columbus is a matter of argument: I asked you for the fact?
A. I will testify that it was sufficient to supply it.
Q. I have not asked you that question. I wan't to know what, in your opinion, according to the best estimate you could
1036 make, the capacity of those reservoirs in gallons?
A. I have no means of determining that. Always employed experts for that.
Q. Did they appear to contain 140,000,000 gallons, the two?
A. I will not answer that because I have no knowledge to base it on.
Q. I asked you if they appeared to contain 140,000,000 gallons?
A. I can't answer it.
Q. You have no opinion at all as to what the apparent capacity of those reservoirs was?
A. Yes, an opinion as to the apparent capacity in regard to population; but not as to the amount of gallons of water it contains.
Q. How can you arrive at that conclusion unless you know that?
A. By the appearance of so many reservoirs.
Q. In your opinion did those reservoirs contain 100,000,000 gallons capacity?
A. I will not answer that.

The MASTER: Can you answer that?
WITNESS: I can't answer that.

Q. You don't know whether they appeared to contain 100,000,000 gallons or not?
A. I don't know.
Q. Did they appear to contain 140,000,000 gallons?
A. I will not answer the question in regard to the number of gallons it contained.
Q. You must answer my questions?

A. I say I can't answer it.

Q. I will ask you from 140,000,000 gallons down to 51,000,000 gallons?

A. I will answer I can't answer it. I will answer down to
1037 51,000,000 that I can't answer it. If you put it one million I will say I can't answer it.

Q. You don't know whether there were one million gallons in those reservoirs?

A. That's my engineer's business.

Q. You don't know whether there was one million?

A. No, sir.

Q. You don't know whether there was one million or 150,000,000?

A. No, sir. Not my business to know.

The MASTER: Mr. Wimbish has asked you if you know the capacity of those reservoirs in gallons; and you stated that you could not tell because you don't know. If there is any explanation of that answer that you want to make, it is perfectly proper to make it.

WITNESS: I know they have supplied the City of Columbus from that time until this; and I know that they are supplying the City of Columbus now.

Q. You know they supplied the City of Columbus in 1902?

A. There was a drought in 1902. Providential act.

Q. You know they had plenty of water there in 1895?

A. They did—well, one moment: excuse me. They furnished the city but there was a drought in '95; but they managed to furnish the city.

Q. They had plenty of water in 1898?

A. I don't know about that. I know they furnished the city because we kept in touch with that.

Q. How do you know?

A. From the reports of the water company.

Q. That is the source of your knowledge?

A. Yes, sir.

Q. Were you down here?

A. No, sir.

1038 Q. Did you ever come down during any of these droughts and look over the situation?

A. I didn't come again until 1902.

Q. You know they are sufficient because the water company told you so?

A. The city took no action against it.

Q. You infer that?

A. I know it as much as you know it.

Q. Did your engineer make any report as to the capacity of those reservoirs?

A. Yes, sir.

Q. What did he report the capacity to be?

A. He reported it—I forget the number of gallons, but considerably short of what Mr. Epping estimated it; but sufficient to supply the City of Columbus.

Q. He reported fifty millions?

A. I can't answer that question. I have not got Mr. Wrenshall's report with me.

Q. You can't approximate it?

A. No, sir.

Q. It was not as much as 140,000,000 gallons?

A. No, sir.

Q. Was it as much as 125,000,000 gallons?

A. I don't think it was as much as that; but I prefer not to answer the question that way.

Q. Could you refresh your memory on that?

A. Only by going back to Baltimore to refresh it.

Q. You say that your engineer made a survey?

A. Yes, sir.

Q. You discussed the matter with him from time to time?

A. I discussed it with him personally during that time; but he came back and made his report—made a written report from
1039 Danville. He was the receiver of the Danville & Western Railroad Company and his report was not received until the last of October. It was only a personal report that he made to me here.

The MASTER: State the year?

WITNESS: 1890. His personal report was made to me here personally and he made a written report afterwards.

Q. You have no intelligent recollection of what the capacity was?

A. No, sir. The law part I refer to the lawyers and the engineer's part to the engineers.

Q. Still you have had a very great experience in these matters as an expert?

A. My opinion was that these reservoirs were sufficient and my opinion has been justified by the fact—my idea was that it was sufficient to supply the City of Columbus—that it does it now with an increased consumption.

Q. Did you read the contract?

A. I did, sir.

Q. Of course you examined to see if that contract was being complied with—you investigate to see whether the contract was being complied with?

A. I did, sir, at the time I was here.

Q. Did you find any filter plant here?

A. I found no complaint.

Q. I asked you if you found any filter plant here in use in the system?

A. Any filter plant?

Q. Yes?

A. There was a small filter plant, as I recollect it, at the end of the reservoir.

Q. In use?

A. In use as I recollect it. Not positive about that.

1040 Q. Did you find any feather edges to the reservoir or thin edges?

A. I don't know what feather edges are.
Q. Do you know what a marginal depth is?
A. No, sir.
Q. You don't know?
A. I don't know what a marginal depth is. I could not put it in the way you want me to know. You want me to answer it in a professional sense?
Q. No I do not.
The MASTER: I will have to call attention to the fact the the colloquies between counsel and the witness are entirely out of order. You asked him if he knew what a marginal depth was and he said he did not.
WITNESS: I say I don't know it professionally. He is asking me as an engineer.
The MASTER: No, he is asking you as a witness. You are on the stand.
The MASTER: If you have any explanation to make of your answer as to why you don't know what a marginal depth is, make it.
Q. What do you understand marginal depths to mean?
A. Depth at the margin.
Q. It means perpendicular depth?
A. Yes, at the margin.
Q. What do you understand thin or feather edges to mean?
A. I would understand that a feather edge was a natural edge and not an artificial one.
Q. In accordance with your understand- or definition, did you find over at the reservoir at that time any thin or feather
1041 edges?
A. I did not examine it with reference to either marginal depths or feather edges. I committed that to our engineer.
Q. You didn't examine to see whether the contract had been complied with?
A. I didn't examine in reference to the engineering part.
Q. What did your engineer report about that?
A. He reported—I think I recollect that he recommended that these provisions be made that was submitted to the water company.
Q. What provision be made?
A. As to feather edges.
Q. That the feather edges there at that time—that they should eliminate the feather edges?
A. Yes, sir.
Q. So there were feather edges there?
A. That I don't know of my own knowledge.
Q. Whose report did you get that from, the engineers. You saw the reservoir?
A. I saw it but I did not examine it for feather edges or marginal depths. I looked at the outside surface.
Q. Did you see any vegetable matter growing on the sides of the pond?
A. Did not.
Q. You didn't examine for that?

A. It looked to me like a great many other reservoirs I had seen all over the country.

Q. As I understand you went over and looked in a general way?

A. Yes, sir.

Q. You could not say whether the reservoir had been built or was being maintained in accordance with the contract?

A. I didn't know the contract required that. I didn't examine it, I repeat over and over again, that I did not examine it
1042 with regard to feather edges or marginal depths.

Q. You made no other examination then yourself to see whether the contract was being complied with or had been complied with in construction?

A. I did.

Q. What was your investigation?

A. I investigated it in the City of Columbus.

Q. I am speaking of the physical conditions at the reservoir?

A. I said I made no physical examination except a cursory one: That was committed to the engineer.

Q. I understand you did not make any examination to see—any physical examination to see if the reservoirs had been constructed or were being maintained in accordance with the contract, that true?

A. I say only in a general sense. I made examination in the City of Columbus. I wanted to know whether they had made any objections to the execution of the contract.

Q. Did you have any investigation made as to the quality of the water?

A. I don't know that there was any technical examination of it, but an examination of it such as you had here. It was perfectly clear, I remember—perfectly clear, palatable water—good water in every respect.

Q. Can you locate the date you were here?

A. Not accurately the date; but it was somewhere between the 7th and 30 of October.

Q. Between the 30th and 7th of October?

A. Yes, sir; 1890.

Q. Now Mr. Colston, you say you examined the income
1043 book?

A. Yes, sir.

Q. For one year?

A. Yes, sir.

Q. What other examination did you make into the financial condition of the company as shown by the books and records?

A. Had no right to make any examination whatever except that.

Q. That's all you made?

A. Yes, sir.

Q. That was your part of the business?

A. Yes, sir.

Q. You spent several days here?

A. I think 3 or 4 days.

Q. In getting up that information?

A. Yes, sir.

Q. That concluded your part of the investigation, did it?

A. Yes, sir.

Q. Now how many people did you speak to on the question of satisfaction or dissatisfaction?

A. Well, it is very difficult to answer that question. I spoke to several bank officials, going into the banks and I spoke to a great many people around; also the hotel keeper.

Q. Was it your purpose to ascertain whether there were complaints—dissatisfaction merely?

A. Yes, sir.

Q. That was your purpose?

A. That was my purpose. I asked also if there had ever been any complaints made to the water company and there was no official report on record then as to the condition of the supply of water.

Q. Ain't you mistaken about that?

A. I think not, so far as I know. Don't think there was any previous to '90.

Q. Did you examine the minutes of council?

A. The members of council?

Q. The minutes and records of council?

A. No, I did not.

1044 Q. Did you examine the records of the water works company as to the matter of complaints?

A. No.

Q. To see if they had made any complaints?

A. No, sir.

Q. Were you advised of the complaints made in '86 and '87?

A. No, sir.

Q. In '88?

A. No, sir.

Q. Were you advised as to the reason why the by-pass was built out there?

A. There are improvements going on all the time in water works.

Q. Were you advised of the specific reason in this case?

A. No; I think the by-pass was constructed out there as the means of——

Q. Were you advised that it was built in order to remedy a complaint?

A. If I was I thought it was the proper thing to——

Q. I asked you if you were advised?

A. No, I don't remember any advice.

Q. In order to remedy a complaint that had been made by the city?

A. I was not aware of any complaint that had been made by the city.

Q. Can you give the names of any of the bank officials that you talked to here?

A. I can not. I can't remember that. It has been 14 years ago now.

Q. Do you remember who the hotel keeper was that you discussed it with?

A. No. Not the one we have now, nor the one that was here when we were here in 1902.

Q. You didn't meet any other city officer here?

A. No, sir; I don't remember meeting any other city officers.

1045 Q. The hotel proprietor that you have reference to, was that the proprietor of the Rankin House?

A. The hotel keeper?

Q. Yes?

A. Yes, sir; that's the house.

Q. Was it the proprietor or the clerk you were talking to?

A. I don't know, sir. I knew people at the hotel, they are the ones generally that hear the complaints from travellers.

Q. Did you go to the water committee of council and ask them?

A. No.

Q. Who was the Mayor then?

A. I don't remember his name sir.

Q. Did you go to the fire department and ask them?

A. No, sir; I don't know that I did.

Q. Did you make any inquiry from any member of the board of health or any physician here as to the quality and character of the water?

A. I don't think I did. I might have done it but I don't remember doing so.

Q. Who was the Mayor?

A. I think I saw the Mayor; but I would not like to testify to that positively. I always go to the city officers, you know and I presume I went to the mayor.

1046 Q. You don't remember that you went to the Mayor?

A. You can get a good many complaints from private citizens. The only complaint that we have a right to listen to is an official complaint. I went out of my ba-lowick to find out if there were any.

Q. What investigation did you make to find out if there had been any official complaint?

A. I inquired and I found none.

Q. You inquired of the hotel keeper and bankers?

A. I think I inquired from Mr. Epping, the water company.

Q. You didn't go down here to the clerk of the council, the city officer to find out?

A. I don't know that I did.

Q. How long had Mr. Epping been connected with the water company?

A. I don't know that: only a short time.

Q. Is it not true that you got your impression that there was no complaint from Mr. Epping and those who owned the stock of the water company?

A. Not only that but from the casual conversations I had around town.

Q. So that your conversations in that regard were casual?

A. Yes, I considered it casual. Certainly no complaint was on file with the water company.

Q. At that time?

A. At that time. Of course complaints are made from time to time and remedied. You know water companies are peculiarly subject to that.

Q. I simply wanted to find out what investigation you made at that time. Now you say you found several peculiar pro-
1047 visions in that contract that commended themselves to you?

A. Three.

Q. One was, the coupons were to be receiveable?

A. Receiveable.

Q. For taxes?

A. Yes, sir.

Q. How were they receiveable for taxes?

A. To the extent of the water rent.

Q. In other words: instead of the city paying the money over direct to the water company, it agreed to receive them equally or to the extent of the amount due the water company?

A. For water rentals.

Q. What is there peculiar about that provision?

A. It guaranteed the coupons to that extent.

Q. The city would be bound to pay those rentals anyhow?

A. Suppose the city wouldn't do it?

Q. Then it would pay the coupons?

A. There are plenty of cities that are not able to pay their water rentals.

Q. Did you find that condition here?

A. Did not find that condition here. Water rent was paid promptly.

Q. You thought that a favorable condition?

A. Yes, sir. Some cities are not able to pay their water rents.

Q. That was not the case here?

A. No, sir.

Q. The city only undertook to pay to the coupon holder instead of the water company what might be due the water company?

A. Yes, sir.

1048 Q. Do you consider that any guarantee of the bond?

A. It is considered an extraordinary guarantee of good faith on the part of the city. A very unusual provision. It made a great impression upon me; because I thought the city was so confident of its position that they were willing to guarantee that much.

Q. It made an impression upon your mind?

A. Very decidedly.

Q. What were the other peculiarities?

A. The next provision was the provision for the acquisition of the works. Of course some works have provisions for municipal ownership that is decidedly to the advantage of the water company and occasionally they are to the advantage of the city. The provision for municipal ownership in this case was perfectly fair and equitable one.

Q. As a result of that conference, based upon that Rankin resolution, conference between the bondholders with their counsel present, what was done?

A. Then it was that action was taken by the bondholders, as I have just explained, reducing their interest and subscribed to additional bonds. Wasn't all done at one meeting, understand.

Q. Why was it that no more bonds were sold?

A. Because we could not sell the bonds in the then attitude of the city. It was a forced contribution.

Q. From the bondholders?

A. From the bondholders.

(By the MASTER:)

Q. You stated in your direct examination, with reference to this list of bondholders that is in evidence, that it contained the names of very nearly all of the original purchasers?

A. Yes, sir.

Q. That list now is a list of the pool of bondholders that agreed to go into this litigation?

A. Yes, sir.

Q. Could you let me have when you go back on the stand, a list of the names of the bondholders on that list that are not
1077 among the original purchasers?

A. I think that would be almost impossible; because Browne & Lowndes sold a number of the bonds and we have not their papers.

Q. You stated that it contained very nearly the entire list—very nearly all of the original bondholders with some few exceptions or such changes that have been made by death and otherwise?

A. Yes, sir. In 12 years there are considerable changes by death, trusteeships, and things of that sort; but there has been very little trading in the bonds. The bonds were sold in Baltimore and held on to by way of investment.

Q. You are not able to give me a list of the names of the bondholders who are not the original purchasers?

A. I would say that almost every one on this list are original purchasers.

Q. Almost all of them?

A. Almost all of them. I should not say there was more than ten in that whole list who were not original purchasers.

Q. Can you give me the names of those ten parties?

A. No, sir; I could not. I have a list of the names of the parties on our books but the books of Browne & Lowndes were destroyed.

Q. How were they destroyed?

A. In the Baltimore fire.

(Court here took a recess for dinner.)

1078 Afternoon Session.

Court met pursuant to recess for dinner and the hearing was resumed.

Examination of witness FREDERICK M. COLSTON was resumed by Mr. Wimberly:

Q. Mr. Colston, you spoke of the time when you were here in Columbus but you could not fix it very definitely, you thought it was not very long before the filing of the bill: Have you had a chance to look into and fix the date more definitely than that?

A. I examined the register of the hotel and I find that Mr. Boardman was here as our representative on the 14th of September, 1902; and that Mr. Burke and Mr. Packard, who is counsel in Baltimore and myself were here on November 14; and that Mr. Burke and Mr. Packard were again here on the 22nd of December.

Q. So that fixes it accurately from the hotel register: 14th of November you yourself were here?

A. Yes, sir. In the meantime Mr. Boardman had made his report as to the conditions and remedies.

Q. Now then before you were down here, at the time Mr. Louis Garrard went north, in the same year, did you see him?

A. Yes, sir.

Q. What time was that?

A. It was sometime in the Spring of 1902.

Q. What was the purpose of that visit?

A. The purpose of that visit was to make an enlargement of the works that would have been sufficient to have overcome any deficiency and especially overcome the deficiencies of the droughts they had experienced before but not to the destroying point.

1079 Q. Who did Mr. Garrard have a conference with looking to that end?

A. I gave Mr. Garrard a letter of introduction to the American Pipe Mfg. Co. in Philadelphia.

Q. Is that what led up to Mr. Ledaux's visit?

A. Yes, sir.

Q. At that time what was contemplated as to the means of raising funds to make those improvements?

Objected to as immaterial and inadmissible and objection overruled.

Q. Just state:

A. Mr. Ledeaux stated, as I recollect it, that it would cost about $90,000 to make these improvements that were necessary or contemplated making. Mr. Ledeaux would have been willing to have taken, I think, the securities of the company in payment of them, provided everything was made right with the city.

Q. On behalf of the bondholders, what was contemplated?

A. The bondholders themselves met and took the same action.

Q. What prevented that action from taking effect?

A. The failure of the city to pay the hydrant rental on the first

of July and the repudiation of the contract. Then we had to fall back on the remedy of the receivership and receiver's certificates.

Q. Which you did?

A. As promptly as we could get the company to consent to it before they were legally liable.

Q. After the city ordinance for an election, was it possible for the company or the bondholders to take final action at once or was it necessary to wait and see what the voters would do?

1080 A. We of course could not take positive action one way or the other until we knew the result of the election. If the election had gone against it we could have sold bonds.

Q. How soon after the result of the election was known did you actively take measures for this receivership?

A. I was here before they commenced on the receivership—not a great while.

Q. When did you have Mr. Boardman come down?

A. Mr. Boardman came down in September.

Q. It was while the matter of an election was actually going on that you had your man investigating?

A. Undoubtedly.

Q. Who employed Mr. Boardman?

A. The bondholders.

Q. Mr. Colston, going back again to '95, '98 and '99: you stated the reasons why it was impossible to sell the bonds: Were there any definite plans contemplated at that time in the way of improvements in either of those years?

A. I think only in general. I don't remember such elaborate plans as——

Q. What was, in a general way, the plans at the time of the election?

A. The plans were to increase the force of the mains into the city and to lay larger mains in the city.

Q. Had that plan of pipes been actually agreed upon?

A. Yes, sir. At that time you will remember the shortage of water was not the Gordian Knot.

Q. There were some questions asked you about whether Mr. Epping, or any one, agreed to take bonds. Will you look at Mr. Spencer's letter (Witness reads letter). Yes, sir, I have looked

1081 over it. He speaks of their willingness to take some of the bonds.

Mr. WIMBISH: We object to this going into the contents of the letter.

Mr. WIMBERLY: I just wanted the witness to refresh his recollection.

WITNESS: Mr. Spencer stated that if we could make up a syndicate to take these bonds, that the friends referred to, meaning Mr. Epping and others, would, he thought, agree to take $50,000. of bonds in the syndicate.

Q. That contained in that letter?

A. October 6, 1890.

The MASTER: You are quoting from that letter?

WITNESS: I am quoting from that letter.

The MASTER: That speaks for itself.

WITNESS: As a matter of business procedure, there is generally a syndicate gotten up to take bonds and that syndicate agrees to take the bonds if they are not sold for the account of the syndicate. Mr. Spencer speaks of the syndicate there, and that was carried out; but the bonds were actually sold by Wilson, Colston & Co., and Browne & Lowndes; and consequently the syndicate was not called upon to take any bonds.

Q. While Mr. Eppings and the others subscribed, they didn't actually take any bonds?

A. No, didn't take any bonds.

Q. Were the bonds ever actually delivered to Mr. Epping?

A. No, sir.

Q. Did he ever actually pay for them?

1082 A. They were actually delivered to the holders in Baltimore and actually paid for.

Q. By them?

A. By them; and nearly all of the holders are on the list already presented—practically all you might say.

The MASTER: You have reference in your last answer to the $325,000?

A. O, yes; to the original $325,000.

Q. You were asked by Mr. Wimbish to get a statement or two: This is the only one——

A. Another one for the same year.

Q. Have you them for any other year?

A. No, have them in Baltimore. That is the year preceding the trouble, 1901.

Q. This is dated 1900?

A. Here is another one for 1901. I have two. These are statements from the officers of the company showing the amounts expended for betterments for the years 1900 and 1901.

Q. The other years you have not with you?

A. No, sir.

Mr. WIMBISH: They are not the statements I called for I asked for the statements prior to the building of the Rose Hill standpipe.

Q. Has any of this been re-paid in bonds withdrawn from the Trust Company? 1900 to 1902?

A. Have not sold any bonds in that time.

Q. Take the statement for the year 1900, interest on bonds, which is put at that time at $386,000, $19,941.92. That's at the rate of exactly five per cent?

A. Yes, sir.

Q. How much would have been the interest if there had been no reduction?

1083 A. $3860. more.

Q. So that all the surplus earnings referred to down here, $3,879.57, includes a little more than one per cent. interest?

A. Yes, sir.

Q. So on betterments, according to the items, a little more than one per cent. was expended?

A. Yes, sir.

Q. New services, new meters, new valves, new hydrants, new mains, new buildings, new pump machinery, that's what your one per cent. you gave up went for?

A. Undoubtedly.

Q. Did these bondholders get any bonds back to cover that or did they make that contribution to the plant?

A. Made that contribution to the plant.

In response to an agreement to furnish certain statements at the noon recess, counsel for the complainant tendered two papers to the defendants' counsel, purporting to be statements for the years 1900, 1901 and 1902, and a letter which covers it up to the beginning of the above years, making three years, and part of one year. (See pages 368, 369 and 344, Volume No. 1.)

Q. Did Mr. Burke purchase some of the bonds?

A. Yes, sir.

Q. Do you remember how many he purchased?

A. No, I could only tell that by looking at the books. We sell bonds to various dealers. Mr. Burke was a dealer.

Q. You can't tell how many?

A. No, sir.

1084 Recross-examination.

(By Mr. MARTIN:)

Q. I understood you to say when you were making these negotiations in 1890, it was a corporation—the Columbus Water Works Co. was a corporation?

A. We understood they were going to make it a corporation, but it was not then an existing corporation.

Q. Didn't you understand that it was an existing corporation?

A. I don't know, of course, about that. That's a law part of the deal.

Q. I will ask you to look at that and see if you didn't sign that?

A. We did.

Q. Wasn't that represented to be the Columbus Water Works Co?

A. It is represented to be the Columbus Water Works Company.

Q. You understood it to be a corporation, didn't you?

A. Yes, sir, rather it is signed by Mr. Epping as President of the Columbus Water Works Co. and signed by us.

Q. You signed the same thing underneath?

A. Signed underneath that, referring to his statement.

Q. You stated this morning that you had a good deal of negotiations with water companies?

A. Yes, sir.

Q. In the purchase of bonds of different companies?

A. Yes, sir.

Q. Is it not your habit to investigate the books of proceedings of

the stockholders and directors to ascertain whether or not the party can legally issue bonds?

A. No, sir. We submit all that to the lawyers.

Q. Your lawyers usually examine them, don't they?

1085 A. Yes, sir.

Q. Did your lawyers examine the books in this instance?

A. Examined what was necessary to——

Q. (Interrupting.) That is not my question: Answer my question categorically and you can explain afterwards: Did your lawyers examine the minutes of the proceedings of the Columbus Water Works Company to ascertain whether or not the stockholders authorized the directors to issue and sell these bonds?

A. I don't know whether he did or not, sir.

Q. Your lawyers usually do those things, don't they?

A. We submit everything to the lawyers.

Q. Where is your lawyer?

A. He is in Baltimore.

Q. He is living?

A. Major Venable: He is very much alive.

Q. Did he state that he had done it?

A. He submitted his opinion.

Q. You stated before that he gave you his opinion: that don't state that he examined the books, does it?

A. No, sir.

Q. Did he ever state verbally that he had examined the stockholders' books?

A. I don't think he ever did, sir. May I state what he does say?

Q. That speaks for itself?

A. Upon what we acted.

Mr. WIMBERLY: These are matters that I never went over in rebuttal at all.

WITNESS: In my own justification will you allow me to read this letter?

Mr. MARTIN: No.

1086 Q. Mr. Colston, in the purchase of bonds of corporations, especially water works companies, or any other corporation, don't you take into consideration at all the cost of the plant?

A. Only in a general way.

Q. Did you in this case take into consideration the cost?

A. Only in a general way.

Q. What general way was that?

A. That was to see that it had cost a great deal of money to build these reservoirs and lay these mains in the City of Columbus.

Q. How much money?

A. I suppose—well, I don't know. I would not say. I can't tell.

Q. You didn't have any estimates made up to find out?

A. No, took our estimates from the income.

Q. Alone?

A. Not that alone, the construction and the appearance of the plant—the visible appearance.

Q. You mean to say that is the way your concern would purchase bonds of $325,000 on a water works plant in Columbus, Ga., without making any investigation as to the cost of the plant?

A. We investigated it through our engineer.

Q. Did your engineer make a survey to make these estimates?

A. He had a map of the pipe lines and made an estimate of it all.

Q. Where is that estimate?

A. It is not here. I think that some of our Columbus papers have been burned up in the fire. I put them in the safe and my safe was burned up. We have a great many of them left.

Q. Will you tell this court that you did have an estimate of the cost from your engineer?

1087 A. I think we did; but I won't be positive about that. I think we did.

Q. You remember the—you brought the opinion of your attorney, didn't you?

A. Yes, sir.

Q. Why didn't you bring the report of your engineer?

A. Because we are on a law point now; and I am bringing all my law papers.

Q. You are not on the facts then?

A. Yes, we are on the facts. I think that's an academic question.

Q. You brought that without bringing the report of your engineer?

A. Yes, sir.

Q. You didn't look for it?

A. If I have got it accessible I think I can produce it.

Q. You didn't produce it?

A. Have not produced it here, no, sir. That report was made in '90, you understand, of course.

Q. Read that report carefully, I want to ask you some questions on it?

A. I have read it, sir.

Q. Did you purchase these $325,000 of bonds and the $10,000 of stock?

A. We purchased no stock at all. We purchased the bonds.

Q. Who was the purchasing syndicate?

A. Wilson, Colston & Co., Browne & Lowndes, our associates were the purchasing syndicate.

Q. I believe you stated this morning that you paid over all the proceeds of these bonds to Mr. Epping?

A. I won't say positively that I paid it over to Mr. Epping, but to the company in some way or form.

Q. Let me refresh your recollection and see if that is not correct: Did you know Mr. Archer?

1088 A. I don't remember seeing Mr. Archer. He may have appeared in the transaction but I don't remember him at all, sir.

Q. To whom did you pay the money to retire the $150,000 of bonds?

A. That would probably have been paid to the Mercantile Trust Co. when they surrendered the cancelled bonds.

Q. I asked you to whom you paid it?

A. I think possibly it would be done that way. I don't know how that was.

Q. If you paid that amount to them, who did you pay the $128,565 to?

A. That would be paid to the water company. If you will allow me to say that the proper procedure would be to deposit the money in the Trust Co. to be paid over upon delivery of all the bonds, etc. That is the usual proceding. It is not handed to Mr. Epping to put into his pocket.

Q. Didn't you state this morning that it was paid to Mr. Epping?

A. Paid to Mr. Epping in that way. Might have been paid to the Trust Company or through the bank. That's what I mean by being paid to him. I don't mean the cash went into his breeches pocket.

Q. Mr. Epping, Mr. Spencer, Mr. Garrard and Mr. Foley subscribed to some of the bonds, didn't they?

A. There was a syndicate; but I don't remember all of them subscribed. I know that Mr. Spencer in his letter made a conditional subscription.

Q. Let me call your attention to something and see if this will not refresh your recollection: I will state what Mr. Epping said about it and it might refresh your recollection: At the time you
1089 settled for these bonds, didn't you receipt them for the bonds for which they subscribed as so much money and then keep those bonds yourself and sell them for their individual account?

A. Possibly we did through the syndicate, as I explained just now. It is possible.

Q. Didn't you receipt, Mr. Epping, Mr. Garrard, Mr. Spencer and Mr. Foley for $15,000 each as so much money to be paid from the proceeds of the bonds?

A. Possibly it is on file. That does not alter one thing I have stated.

Q. And didn't you then sell these $60,000 of bonds for their private account?

A. Possibly we did.

Q. And they got the profit from them?

A. I don't know. I think possibly we did. If they were in the syndicate it would have been proper.

Q. You think it is very probable?

A. If they subscribed to the syndicate they were entitled to the profit on the sale of the bonds.

Q. When you wound up the proceedings you would very likely of course just give him a receipt to represent the bonds, wouldn't you, instead of giving him the money, Mr. Epping?

A. Yes, sir.

Q. Then you kept the bonds for their individual account and sold them for their individual account?

A. Yes, sir.

Q. You stated in answer to Mr. Wimberly's question a few mo-

ments ago, that in '98 you contemplated increasing the size of the mains: Why did you do that?

A. Because at times there was a report that there was a
1090 deficiency of pressure.

Q. You contemplated it, why didn't you do it?

A. Because the credit of the company was destroyed.

Q. The credit was destroyed in 1898?

A. In '98. They had had 2 or 3 different elections for bonds.

Q. One in '94 or '95 and the other one in '96?

A. Yes. More than that, the bondholders had been compelled to give up one sixth of their interest up to that time.

Q. Well, you thought it necessary to increase these mains—you thought it was the proper thing to do, didn't you?

A. It was not absolutely essential.

Q. Why did you contemplate it if it was not essential?

A. Simply because we were looking to the future.

Q. In other words: you were going to increase the size of the mains and increase the pressure, not because it was——

A. (Interrupting.) You are asking me: I am not the company.

Q. When you answered Mr. Wimberly a few moments ago you meant the company contemplated doing it?

A. It was contemplated.

Q. Didn't you say the credit of the company was destroyed by these elections?

A. I said——

Q. Didn't you say so this morning?

A. I say it was impaired.

Q. Didn't you use the word destroyed?

A. I don't think I did.

Q. Didn't you say the elections vindicated the company?

1091 A. We think that they did do so. Certain attacks were made on the company by the city officials which was not justified by the conditions.

Q. In May '98, '99 and 1900?

A. Had been made before that.

Q. Had it been made then?

A. I think the same thing was cropping up a little bit from time to time.

Q. Why did you advance the money to build the Rose Hill standpipe?

A. Simply it was a matter of saving what we had in it. As I explained, it was a forced contribution from the bondholders.

Q. Wouldn't it have been saving what you had in it by making the system efficient?

A. The system was efficient.

Q. It didn't need these other things?

A. It was efficient because the city had never taken the steps which the contract called for to make it inefficient.

Q. Your idea is then, if I understand it, that although the company may have violated the contract, if the city didn't complain, it is no violation?

A. I will submit that to you as a lawyer.

Q. I want to know what your understanding is?

A. My understanding is, that until we are notified by the terms of the contract by the contracting parties, that it is efficient and it is an existing contract.

Q. Not asking you about any existing contract: Can't it be an existing contract even though some of its terms have been violated?

A. No official evidence.

Q. No official evidence?

A. No, sir. No legal evidence of it.

1092 Q. Suppose the company knew that its mains were too small and the city didn't complain, wouldn't you think they ought to make them larger?

A. I would say they didn't have sufficient legal evidence they were too small.

Q. If they knew it themselves it would not?

A. Yes, I say that.

Q. You sent out that circular to the would-be purchasers?

A. Yes, sir.

Q. Now you sent that out after your engineer had reported that these reservoirs didn't contain this amount of water, didn't you?

A. Yes, sir.

Q. You put it in there that they contained 140,000,000 gallons?

A. I didn't put it there.

Q. You endorsed it?

A. No, sir; we didn't endorse it. That refers to the statement.

Q. Do you think the purchasers of these bonds would consider it contained 140,000,000 gallons?

A. The purchasers did not take that into consideration at all. The income is what they take into consideration.

Q. Don't care whether the reservoirs contain a million or a half a million gallons?

A. Suppose our engineer said it contained that much and the mortgage said more, we wouldn't know which to put in.

Q. Wouldn't you be apt to rely on your engineer?

A. I don't know about that, if there were conflicting reports.

1093 Q. You sold these bonds upon the representation of Mr. Epping and not your engineer?

A. Not entirely.

Q. Made it as an inducement?

A. We bought them on our own examination.

Q. You know how many bonds had been issued in 1900?

A. No, can't say that, sir. Don't know that there has been issued since 1900. I don't know whether there has been or not.

Q. Here's a statement that you produced: How much does that say had been issued at that time?

A. I don't know.

Q. Can't you read it?

A. What's the question?

Q. How many bonds had been issued up to that time?

A. Sold and outstanding, $371,000, by this statement. Held in

Treasury and hypothecated for money borrowed, $29,000.

Q. This is in 1900, March 26. Since that time there has been $21,000., making $392,000?

A. According to that statement, yes.

Q. Wasn't that true?

A. I believe it to be true. There were several purchases of bonds going on at that time which had to be done to preserve the works.

Q. They could not do so except for betterments?

A. No, except for betterments; and a sworn statement for betterments had to be made.

Q. Then they did get back $21,000. for betterments in bonds?

A. Very likely they did. They did that from the surplus income, for betterments. You must remember that the betterments were larger than they have issued there.

Q. This don't show it?

1094 A. That probably don't show it; but the extra income was expended on betterments. A great many years of betterments made and no bonds sold.

Q. This is the information they furnished you?

A. Yes, sir.

Q. You don't know it as a matter of fact?

A. No, I didn't come down here and measure it.

Q. You don't know it from any of their reports: they didn't send you an itemized statement, did they?

A. Generally sent me an itemized statement of the amounts.

Q. Wouldn't tell you how much mains would be bought and how much they paid for it?

A. Same kind as that. There is one and yonder is another. Ev-rything of that sort was put down.

Q. Did they state how many?

A. Yes. Look at that. Mr. Wimbish has it now.

Q. This is the letter from Mr. Spencer is dated from New York?

A. Yes, sir.

Q. These parties were there in New York, were they?

A. What parties?

Q. Mr. Garrard—friends of Mr. Spencer?

A. I don't know that.

Q. I see a part of this has been cut out?

A. I mentioned what has been cut out. The price at which the bonds could be bought. I supplied that much, 90, from recollection.

Q. Ninety?

A. Yes, sir.

1095 (By Mr. WIMBERLY:)

Q. I want to get these figures straight: I will ask you about the bonds sold subsequent to March: According to this statement sold and outstanding $371,000., bills payable $20,250., which makes a total of $391,250: The $20,250 being held in treasury against bills payable: Is that all the bonds extended out here as having been issued: How much has been issued to date?

A. To date there have been $392,000. issued, that's in the hands of the public, $392,000.

Q. So then at the time of this statement, if this is correct, $392,000., there has been none issued since?

A. He has added in the interest on the bonds.

Q. He has added in the amount owing against the bonds in the face of the bonds?

A. Yes, sir.

Q. Have there been any bonds issued since that time, as well as you can remember: That will be a matter of figures: Will you let me see the letter of your lawyer that you referred to?

A. Yes, sir.

Q. I will ask you if you yourself saw or submitted to the bondholders the minutes to see whether the bonds and mortgage were legally binding obligations: Who passed upon the question as to whether the bonds and mortgage were legal obligations?

A. Venable & Packard.

Q. Who passed upon the question as to whether the minutes made them legal obligations?

A. I presume they did. Generally expected of them.

Q. All these matters were referred to the lawyers?

A. Unquestionably.

1096 Q. You spoke about the payment of money: How is this matter of paying out money decided: who determines whether it is legally paid out, the purchasers?

A. Of course, we don't pay out any money until we get the mortgage all properly executed and recorded; and then the bonds have to be engraved and printed and have to be resigned by the trustee. All these proceedings are gone over by the lawyers; and then when that is done we are delegated to take up and pay for the bonds.

Q. The money is paid through what channel?

A. Paid in various channels. Sometimes it is paid to the trust company.

Objected to.

Q. I will confine myself to how it was done in this case: Do you know from memory how it was done in this case?

A. No, I don't know from memory how it was done.

Q. Who passes upon these questions?

A. The lawyers.

Q. Who was the lawyer in this instance?

A. Venable & Packard.

Q. You stated in reply to a question by Judge Martin, that you concluded the worth of property from the income together with the physical appearance of the plant: How much did you conclude or estimate the value of this property to be in dollars?

A. I estimated that it was fully worth $325,000., for which it was bonded, no matter if the income had been twice as much as it was. I found only a few miles of pipe from the reservoir; and from the size of this place, no matter what was the income, I would have

bought it. Two things taken into consideration that de-
097 termined it.

Q. They asked you about signing this statement of Mr. Ep-
ing's?

A. Yes, sir.

Q. With regard to the difference in the storage capacity in the estimate of the engineer: I will ask you whether that was regarded of such materiality as to call especial attention to it?

A. I didn't so consider it. I regarded the lowest estimate that was made was sufficient for the City of Columbus and is sufficient now.

(By Mr. MARTIN:)

Q. You say you did not regard this question as material, as to the storage capacity?

A. I didn't regard it as being so material as to affect the negotiations in any way.

Q. Well, don't you regard it as material when you are sending out statements to state the facts or truth?

A. I stated what was given to me by the president of the company.

Q. You did?

A. Yes, sir; that's it.

Q. But you failed to state what your engineer reported that you had employed to make the estimate?

A. Yes, the engineer's estimate was open to everybody. The engineer's report was on file in our office and open to everybody.

(By Mr. WIMBERLY:)

Q. Was that fact stated to the purchasers of the bonds?

A. Yes, sir; certainly. I think a great many of them read it. It was always open you know.

1098 Complainant here tendered in evidence a list of the depositors of the Columbus Water Works Company first 5% bonds, as will be found on page 348, Volume No. 1.

Complainant here tendered in evidence letter from Samuel Spencer, dated October 6, 1890, addressed to F. M. Colston, Esq., Baltimore, Md., as will be found on page 358, Volume No. 1.

Complainant here tendered in evidence written opinion of Venable & Packard as to the validity of the bonds and contract.

Objected to because the witness (Colston) stated that he purchased the bonds for his firm (Wilson, Colston & Co.), prior to the date of the opinion on the verbal opinion of Major Venable, showing that this is not the paper upon which the people acted, and that said paper is inadmissible, irrelevant and incompetent.

The MASTER: I am not inclined to let that paper in. I don't think it is admissible.

Complainant tendered in evidence circular letter to the owners of the bonds of the Columbus (Ga.) Water Works Co., dated Baltimore, December 4, 1902, and signed by Frederick M. Colston *et al.*, Committee, as will be found on page 344, Volume No. 1.

Complainant here tendered in evidence three statements of
1099 betterments, etc., of the Columbus Water Works Company, as will be found on pages 368, 369 and also circular letter of Wilson, Colston & Co. and Brown & Lowndes, as will be found on page 355, Volume No. 1.

The above first two statements were objected to by the respondents because they were not in response to the request made for statements; and that they were irrelevant, inadmissible and incompetent.

Objection overruled.

1100 JULIAN T. BURKE, sworn by the complainant, testified as follows:

(By Mr. WIMBERLY:)

(This witness was sworn at this juncture by agreement of counsel.)

(By Mr. WIMBERLY:)

Q. Mr. Burke, where do you live?

A. Alexandria, Va.

Q. What is your business?

A. Banker and broker.

Q. Without going into the matters covered by your affidavit, of the issue of bonds of the Columbus Water Works Co. that you heard Mr. Colston testify about, the original $325,000., did you handle any of those bonds?

A. About $70,000.

Q. You sold yourself?

A. I did.

Q. To whom did you make the sales?

A. Well, I made a sale of $5000. to the trustees of the Protestant Episcopal Theological Seminary and High School, and $2000. to the Trustees of the Protestant Episcopal Educational Society in Virginia, and I have two trust funds amounting to $5000. each and another one of $4000.

Q. This signed here J. T. Burke *et al.*, Trustees?

A. Yes, sir; those are the chief ones?

A. Yes, sir; those are the chief ones?

Q. You say these you are trustee for and these other purchases, upon what did you rely in making the purchase?

A. I relied upon the recommendation of the matter in the hands of Wilson, Colston & Co., with whom we have been dealing
1101 ever since they were a firm.

Q. These Virginia parties, what was the name of the lady in Virginia you spoke of?

A. Well, Mrs. Neville, and one was Mrs. ——.

Q. Miss Mary Custis Lee, you make that sale?

A. I did.

Q. Who is she?

A. She is a daughter of General Robert E. Lee.

Q. What did you say you relied upon in making the purchases?

A. The representations and material bearing upon this company in the hands of Wilson, Colston & Co.
Q. What Mr. Colston referred to?
A. Yes, sir.
Q. I will ask you whether that embraces the letter from Major Venable?
A. Yes, sir. He showed me all of the papers.
Q. Showed you what?
A. All the papers he had.
Q. You relied on those?
A. We relied on those.
Q. The purchasers from you what did they rely on?
A. Well, I suppose they relied on me.
Q. Did you explain the same facts to them—give them the same information you had?
A. I gave them all the information I had.

Cross-examination.

(By Mr. WIMBISH:)

Q. Would you have bought these bonds except for the recommendation of Wilson, Colston & Co.?
A. Possibly I would not have known of them.
Q. What I mean to say is, did you investigate so carefully as to arrive at your own independent conclusion, or did you rely on——
1102 A. Well if the same information had been brought to me by another broker that I had the same confidence in, I would have bought them.
Q. That you had the same confidence in: You bought them because you had confidence in the broker?
A. To the same extent.
Q. To what extent?
A. I don't know.
Q. Did you see the report of the engineer?
A. I presume I did.
Q. What did he report as to the capacity of the reservoirs?
A. It has been about 13 years ago and I don't recollect.
Q. You had been dealing a long time, I believe you said, with Wilson, Colston & Co.?
A. Ever since they have been in business.
Q. You had great confidence in them?
A. Yes, sir.
Q. And you bought upon their recommendation?
A. Yes, sir.
Q. Did you sell any of these bonds to Grover Cleveland?
A. No. He is not a client of mine.
Q. Did you sell any to any orphan asylums?
A. Have not any orphan asylums over there.
Q. Did you sell any to business men?
A. Yes, sir.

Q. To business people?
A. Yes, sir.
Q. Mr. Burke, you have invested Trust funds in other bonds, have you not?
A. O, yes.
Q. In nearly every case you sell some bonds to churches and trustees?
A. Yes, a good many of those institutions are among my clientele.
Q. When you sold them you thought the bonds were good?
A. I undoubtedly did.
1103 Q. Even if they were not good?
A. Yes, sir.
Q. They relied upon you, the purchasers?
A. Yes, sir; to a very great extent.
Q. Did you show them any of these papers, the engineer's report, attorney's report, or anything of that kind?
A. Unless they were copies. I didn't show them any of the originals because I didn't have them.

(Court here took a recess until the next day.)

1104 Respondents here tendered in evidence the report of B. M. Hall, so much as was read by him and referred to, as is found on pages 17 to 51, inclusive, of the printed report on the water supply of Columbus, Ga., to City Council of Columbus, dated Atlanta, Ga., August 8, 1893; which report will be found on page 490, Volume No. 1.

R. W. LEDSINGER, sworn by respondents, testified as follows:

(By Mr. MARTIN:)

Q. How long have you lived in Columbus?
A. Since the War: about 37 years.
Q. Since the Civil War?
A. Yes, sir; since the Civil War.
Q. Have you held any office in connection with the City of Columbus?
A. Yes, sir.
Q. What office is it?
A. Sanitary Inspector.
Q. When did you first become Sanitary Inspector?
A. In December, 1893, I took the office.
Q. State whether you have been in that office ever since?
A. Except one year, 1896.
Q. What are your duties as Sanitary Inspector?
A. I am the general health officer, looking after the cleanliness of the city and the health of the city generally.
Q. Have you in connection with your office as Sanitary Inspector, anything to do with looking after the condition of the reser-
1105 voirs of the Columbus Water Works Company?
A. Yes, sir I have been over there in the capacity of sanitary inspector looking after conditions.

Q. How often have you been over there?
A. Quite a number of times. I could not tell you.
Q. How soon after you became sanitary inspector did you go out there?
A. I think the first complaints we had was in 1895. I went out to the reservoir to look and see what was the matter. The water would get muddy, smell bad and taste bad; and I kept getting complaints and I thought to satisfy myself I would go out to the reservoir and see.
Q. In '95, what time of the year was it you went out there?
A. It was in the Fall—latter part of the Summer or Fall.
Q. 1895. What did you find the condition to be at that time?
A. The water was very bad. The pond was in a terrible fix then. There was no water scarcely in the upper reservoir at all; and there were—I think that was the year, I won't be positive—that's the first year, twice I came across a great number of dead fish in it. I think '95 was the first year; but I won't be positive.
Q. Did you find many dead fish?
A. Lots of them. I went to Mr. Epping and told him he must take them out—remove them.
Q. Did they do it?
A. Yes, sir.
Q. What quantity did you see there?
A. At that time? I don't recollect: probably a barrel or two at that time. In 1892——
Q. '92 or 1902?
A. 1902.
1106 Q. In '95 you say there was very little water in the upper reservoir: What was its condition at that time: Describe its appearance at that time?
A. Just like any other pond that had gone dry. Nothing but a little stream of water running right through the center of it. Looked like a little ditch*ed* had been opened and the water was filthy and bad. Wasn't fit for use, hardly.
Q. What was the condition of the area that had been covered with water?
A. It was full of weeds and mud, lush and so on. Part of it, in the upper end of it, just above the bridge, hogs were in it rooting in it.
Q. What did you say?
A. In the upper end of it, that was above where the bridges are, where it heads, hogs were in it and cows.
Q. At that time, in '95?
A. Yes, sir.
Q. What was its condition as to vegetable matter?
A. Plenty of weeds and grass growing all over it—the bottom of it.
Q. That confined to the upper end?
A. No, that was all over the principal part of the upper reservoir.
Q. Any efforts made to cleanse that reservoir?

A. Not at that time I don't think there was anything done, except to get the dead fish out.

Q. What was the condition of the water in the lower reservoir at that time?

A. It didn't look clear, it stunk, didn't smell good and didn't taste good and it had dead fish in it.

Q. How often after that, '95, did you visit it?

A. I go to the reservoir every summer.

1107 Q. Did you ever find its condition similar to what it was in '95?

A. Yes, it was worse in '02—much worse.

Q. How was it in '98?

A. I don't recollect the dates. There was one year the water got low; but never was as bad as it was in '95 and 1902.

Q. What was the condition of the water from 1893 up to 1902?

A. Well, most of the time it was good and plenty of it. At times it was very low, in the summer and Fall; and when it got very low it would be muddy and bad. Sometimes the water would be muddy and then it would be clear. After every rain nearly it was muddy.

Q. How often would you say—how many years from '93 to 1902 did it have this odor about it?

A. Two years it was so bad, '95 and '98, my recollection is.

Q. How was it in the Fall of other years during dry seasons?

A. Never had any real dry seasons that I recollect of. My recollection the water was good except those years.

Q. Coming down to 1902: Did you visit it then?

A. Yes, sir.

Q. What was its condition at that time?

A. When I visited it I got the Board of Health to go over there. I had gone myself and saw the condition of it and I got the Board of Health to go with me. It was in a frightful condition. Wasn't fit for anything hardly. It was in a bad condition. No water in the upper pond at all. Don't think it was running hardly, at times. Been over there when there was no water in the lower reser-

1108 voir. Let it all out so as to wash out the bottom.

Q. When was that?

A. That was in 1902.

Q. What was its condition at that time, the lower reservoir?

A. That's the time. Standing about in the pond were myriads of dead fish—they were just thick. One time I went over there I think there — three barrels—3 or 4 cotton baskets full they had gotten out and they were still raking them out.

Q. That was at the lower reservoir?

A. Yes, sir; and the stench was awful. I came back to the city and reported it to the Mayor.

Q. At that time when they were cleaning it out, where were they getting water at that time?

A. I suppose out of the standpipe. I don't know whether they pumped it from the river or not at that time. I don't know how they got water.

Q. Do you know about the time they began pumping from the river?

A. Yes, sir.

Q. What time was that?

A. I don't recollect, a day or two after I went over at the time there was so many dead fish in it. In a very few days they had the pumps connected up and commenced then to pump from the river.

Q. What was the condition of the reservoir in 1902 when you saw it with reference to vegetable matter?

A. Nothing but muck and full of weeds and grass. At one time when I was over there they were hauling out muck and it was very muddy and the mules would bog up, couldn't do much. Mr. Long over there was cleaning it out. Didn't do a great deal.

1109 Hauled it up on a ridge there—laid it up on a hill, grass and stuff. He said he was going to make compost of it.

Q. Mr. Ledsinger, have you ever visited the fires in the last 10 or 15 years?

A. No, sir; I don't recollect visiting but two fires, that was in '96 when the Phillips' houses down here were burned——

Q. '95?

A. Yes; and then at the Columbus Iron Works fire. I don't go to fires.

Q. You don't attend fires?

A. No, sir, unless it is in my neighborhood.

Q. What was the condition of the water in Columbus that was used before they turned on the river water?

A. Just before they turned on the river water?

Q. Yes?

A. Was not fit for use, that- all. Stunk and was not fit to bathe in really.

Q. How was it after they turned the river water on?

A. At times it was pretty good, whenever they would have a dry spell and the water got clear. Since they got their filter it is not so muddy. When it was muddy you couldn't use it at all. Never used it at all at my house. Cleaned out the well and used well water.

Q. Wasn't there an odor about the water after they turned on the river water?

A. Yes, sir; smell was in the room when you turned it on.

Q. How long did that condition prevail that the water had an odor in it after they turned on the river water?

A. I don't know exactly how long it was, until the company went into the hands of a receiver. They put in a filter after Major Greene took charge of it. After that the water was good and has been good ever since.

1110 Cross-examination.

(By Mr. WIMBERLY:)

Q. You say you have lived here all of your life?

A. No, sir; I didn't say so.

Q. Ever since the War?

A. Yes, sir.

Q. The civil war?
A. Yes, sir.
Q. The water supply from there was sufficient up until about '95, wasn't it? That's the first time the stream ever became low enough to have any trouble?
A. The first time I recollect of it, sir.
Q. In '95 you had an exceptional drought, didn't you?
A. My recollection is we did.
Q. And the water got worse of course than it had ever been up to that time?
A. Yes, sir.
Q. Then you had no droughts, none to amount to anything, until '98?
A. That's my recollection of it.
Q. That was not as bad as '95?
A. No, sir.
Q. Then you had no more droughts until 1902?
A. 1902.
Q. That was the worst of all?
A. Yes, sir.
Q. In '95 the water never gave out in the reservoir?
A. Which one?
Q. The lower reservoir?
A. No, sir.
Q. But in the upper reservoir?
A. Yes, sir.
Q. The water never gave out in the lower reservoir until 1902?
A. That's my recollection of it.
Q. The water did about give out in the upper reservoir in '95—practically gave out?
A. It was exhausted in the upper reservoir.

Q. The stream to supply the lower reservoir it continued
1111 to flow, always fresh water coming in the lower reservoir?

A. Always claimed, but I don't know whether it is true or not, that there were springs in the lower reservoir that kept it in water.

Q. Besides these springs always water coming in from the upper reservoir?
A. In '02 was not.
Q. Speaking about '95?
A. I think probably there was a little branch but it would not amount to nothing.
Q. It was running water?
A. I don't think it ever went clear dry.
Q. Now the only two times that there were any dead fish were in '95 and 1902?
A. Yes, sir.
Q. Several times more in '02 than in '95?
A. Yes, sir; a great many more.
Q. How many more, would you say 8 or 10 times as much?
A. Yes, sir. Great many more fish in the lake at the time.

Q. They were pretty abundant in 1902?
A. Plenty of them.
Q. Any dead fish in '98?
A. Don't think there was. Never saw them if there was.
Q. Well, the water was not very objectionable in '98?
A. A good deal of complaint made about the scent of it and taste of it.
Q. In '98?
A. Yes, sir.
Q. Been three times about the quality, '95, '98 and '02?
A. That's all I recollect of.
Q. None anything like as serious as 1902?
A. No, sir.
Q. In '95 how long did the trouble last, that is, how long was the water what you would call bad?
1112 A. I don't recollect.
Q. Wasn't anything like as long as 1902, was it?
A. I don't think it was.
Q. A comparatively short time?
A. Probably a month or six weeks.
Q. Was it that long? It was not long enough for it to dry up in the lower reservoir?
A. No, never did dry up in the lower reservoir.
Q. It never got especially low in the lower reservoir in '95?
A. My recollection of it there was probably one third of the pond bottom that was dry.
Q. Down about one third?
A. Yes, sir; I think one third of it was empty, except a little stream running into it probably one third of the way down. The pond comes down in this way (Referring to photograph No. 1 in evidence).
Q. Now let me see if I understand you: We are still talking about '95?
A. Here it is. Now this is the upper end of the lake.
Q. Upper end next to the upper reservoir?
A. Yes, sir. Comes down this way and turns. My recollection is in '95 the water was out of this lake about here, to this angle.
Q. About one third of the distance down?
A. About one third of the distance down to this point here—this bend.
Q. From the upper end—next to the——
A. Next to the upper reservoir down to this bend here, my recollection of it was dry, except a little branch.
1113 The COURT: That was in '95?
A. Yes, sir.
Q. The lower part is the wider part?
A. Yes, sir; and the deeper.
Q. Now in '98 the water never got any lower than usual in the lower reservoir?
A. No, sir; I don't think it got a great deal lower than it did——

Q. Did it get a good deal lower in the upper reservoir?

A. Yes, sir; the upper reservoir came very near going dry.

Q. The mud you speak of in the upper reservoir that was left exposed in '95 and in '1902, was off on each side of the stream that was running through it?

A. Off from the surface—all over the surface of the lake—bottom of the lake.

Q. I understand there was no water running over that mud at that time?

A. No, there was none to run over it.

Q. The water was running down in the channel of the stream?

A. Yes, sir; a little ditch had been cut looked like to let it all out, get it near the center as possible to draw it off. No water would seem to rise up in the lake. No stream running in 1902.

Q. In '95 there was a little stream?

A. Yes, sir; a stream running all the time.

Q. That stream was in the channel—the center?

A. Yes, sir.

Q. Didn't run over the sides?

A. No, not enough of it.

1114 Q. It never became necessary to condemn the water in '95 or '98?

A. No, it was not condemned; but I don't know but what it ought to have been.

Q. You were the sanitary inspector?

A. Yes, sir.

Q. You took no steps to have it condemned?

A. I reported it to the Mayor, the condition of it, and the aldermen.

Q. Have you a Board of Health here?

A. Yes, sir; have a board of health. I don't remember whether they went—I think probably the board of health did go out in '95. I don't recollect. It has been a long time.

Q. In fact you have had a board of health ever since you have been sanitary inspector?

A. Yes, sir.

Q. It was condemned in 1902?

A. The Board of Health condemned it in 1902.

Q. That was the first time it ever became actually necessary to condemn it?

A. That was the first time it was condemned.

Q. When it was condemned they ceased to use it and used river water?

A. Not then. Never used river water for sometime: Some little time after the board of health went over, came back and made a report to council. So little time before they got in the pumps.

Q. The pumps were put in?

A. Yes, and used.

Q. As soon as the condemnation was reported to the water company, they commenced using river water—had the pumps put in?

A. I don't know whether they had the pumps in or not. I recollect I went to Mr. Garrard myself about it. I know I told him he

ought to do something to relieve the people. I think I told him that it was a sin to treat the people like they were doing.

1115 Q. What I mean is they didn't lose any time putting in the pumps?

A. They pumps were already in. That's my recollection of it, had them already put in.

Q. When you went to Mr. Garrard, he told you, didn't he, under his arrangement with the city, they had promised not to turn on the river water until the city ordered it and as soon as the Mayor ordered it it would be turned on?

A. That's what he told me.

Q. It was done?

A. No, it was not. The Mayor never did order it.

Q. They did turn it on?

A. Yes, sir; they did turn it on.

Q. Do you know how long they used river water?

A. I think they used it all the balance of the summer and until the plant was put in the hands of a receiver. Used river water for a long time because it was dry a long time.

Q. You had an unusually long dry spell?

A. Yes, sir the longest I ever recollect seeing.

Q. Nearly all the streams around here practically failed?

A. Yes, sir.

Q. The wells, a great many of them dried up?

A. A great many of them.

Q. Since you came to Columbus, right after the civil war, you never have had a drought anything like this one in 1902?

A. No, sir; never have seen any.

Q. Did you see any excavations made in 1902, during this drought, to see how deep down the ground was dry?

A. Never noticed.

1116 Q. It was, without calling any particular excavation to mind, but from your general observation of excavation where the dirt was thrown up, the dirt was dry some 15 feet down?

A. It was very dry; and I recollect, since you have mentioned it, digging a sewer somewhere, and it seems to me that I recollect the dirt was very dry. The earth was just as dry as it could be.

Q. You say the river water was sometimes pretty muddy and at other times not so bad?

A. Yes, sir.

Q. That depended, of course, on the changes and condition of the water?

A. On the rain.

Q. Whenever there was a rainy season the river water would get muddy?

A. Yes, sir.

Q. And when it was not specially rainy?

A. It was partially clear.

Q. There has been no failure of the water supply or muddiness of the water, since this filter was put in?

A. Not since this filter was put in.

Q. Even when it was muddy, when they get it from the river, there was always plenty of it?

A. Yes, sir; plenty of it as far as I recollect. I never used it.

Q. As much as you cared to use of it?

A. Yes, sir; if anybody wanted to use it—more than you wanted to use.

Redirect examination.

(By Mr. MARTIN:)

Q. In '95 and '98, if the board of health had ordered the water cut off, what would have been the situation in Columbus?

A. We would have been in a bad fix. We would not have
1117 had any water.

Q. No connection whatever with the river water—with the pumps?

A. No, sir.

Q. In '95, suppose they had ordered the water cut off, what would have been the situation with reference to the people getting water?

A. Would not have had any water, except they would have went back to their wells.

Q. Well, after the water works was established and the people began taking water from the water works company, what did the people do: abandon the use of their wells?

A. Most of them filled them up. A great majority of them had them filled up.

Q. In '98, suppose if it had been condemned, how could the people have gotten water?

A. This lower standpipe was built then but they could not have gotten any water at all. If the water had been cut off they could not have gotten any at all. No connection I don't think with the river.

Q. If there had been river water turned on in '98 or '95, would there have been any way of separating it from water for fire protection and the water for the people to use?

A. No, sir.

Q. You spoke about the drought in 1902, did the springs go dry around here?

A. I don't know. I know the spring out here didn't give out.

Q. Do you know where the people got water in 1902?

A. Mrs. Hurt furnished water from their spring; and a great many people bought it. A great many of the wells went dry in the yards.

Q. State whether or not there were wells bored in the city in 1902?

A. Yes, sir.

1118 Q. They got water, didn't they?

A. Yes, sir.

Q. Wasn't so dry but what they get water by boring or digging wells?

A. Yes, sir. I know some people dug their wells deeper.

Q. Has there been any time within the last 10 or 15 years, until

1902, if the water had been cut off from the reservoir the people would have had any supply?

A. No, sir; not as I know of.

Recross-examination.

(By Mr. GARRARD:)

Q. Don't you know it to be fact, as far back as 1892 or '93, that there was a very large pump brought here to pump out one of the river steamers that sunk at the wharf and was afterwards sold and bought by the water company and kept ready for use, so that pipe could be laid on top of the ground and connected at any time in case the bridge should go?

A. No, always understood you had a main laid and the pump in the river.

Q. In addition to that this main was laid and the pump kept in Flournoy & Epping's warehouse for that purpose?

A. I don't know it.

Q. For an emergency?

A. The only pump that I knew of you having, was the one you had on Rose Hill to fill up the standpipe. The only time I ever knew you had a pump.

Q. In point of fact isn't that the same pump?

A. I don't know. The first time I ever knew you had one was when I saw you pumping there.

Q. Do you recall the fact when it was loaned to the steamboat company to pump out a steamer at the wharf here?

A. I don't recollect that.

1119 Q. That pump at the foot of Rose Hill: don't you recall that it belonged to the water works company afterwards?

A. No, never knew they owned it until I saw it there pumping.

Q. As a matter of fact couldn't you lay pipe on top of the ground to the river and in an emergency, in a very few hours you could pump water into the mains?

A. I suppose you could.

Q. From that pump?

A. I suppose you could.

Q. In point of fact, if the pump was in existence at that time, was there a time at which the water could not have been forced into the mains from the river in case of an accident?

A. I suppose not, if you had the pipe and everything ready.

Q. How long would it take to lay a pipe 100 feet on top of the ground?

A. Not long.

Q. The pump at the power house of the Columbus Railroad Co., don't you know as a matter of fact that pump had a suction put into the river at the time that pump was put up?

A. Which?

Q. At the Columbus Power house?

A. It seems to me that there was a pump put there. Wasn't that pump put there to do away with the pump on Rose Hill?

Q. No, I am talking about the pump which was put into the house of the Columbus Railroad company—the power house?

A. I don't know anything about that.

Q. Don't you recall the fact that the pump had a suction connected with the river and sealed up?

A. I don't know anything about that. Never heard of it.

1120 Never had any business with it and never bothered with it.

(By the MASTER:)

Q. Do I understand the witness to say that there was a pump in the river and a connection with it in '98?

A. No, sir; I never said there was any at all.

1121 A. J. LAND, sworn by the defense, testified as follows:

(By Mr. MARTIN:)

Q. Mr. Land, how long have you been a resident of Columbus?

A. About 15 years.

Q. What has been your business during that time?

A. Well, a portion of the time I worked in the machine shop of the Columbus Iron Works; and about 11 years of it with the fire department.

Q. The last 11 years?

A. No, sir. I have been with the fire department about 4 years the last time and about seven the first time I was with them.

Q. When did you commence with the fire department?

A. I think it was in September, 1890.

Q. How long did you remain there?

A. About seven years.

Q. Then there was an interval?

A. Yes, sir.

Q. Of how many years?

A. About 3 or 4 years. I won't be positive.

Q. Since your last connection you have been continuously with the fire department?

A. Yes, sir.

Q. Well, what position do you hold with the fire department?

A. From supernumerary to assistant chief. Part of the time I was supernumerary, I acted as stoker and part of the time driver and a portion of the time as engineer of engine company; and then went to assistant chief.

Q. You are assistant chief now?

A. Yes, sir.

Q. How long have you held that position?

A. I have held it since 15th of December, 1902.

1122 Q. Well, what has been the pressure of the water for fire purposes during the time you have been connected with the fire department at various times?

A. At various times it has been very poor. We could not get efficient service from the different sizes of mains and the discharges connected with it.

Q. What do you mean by inefficient service?

A. We could not have gotten water enough from one fire hydrant to supply one engine with its capacity.

Q. Well, what were the difficulties?

A. The water was not there, I presume, because all through the city didn't have pressure to force it through the small mains or the mains were too small one. Don't know that I have ever seen it fail totally.

Q. State whether or not the mains were obstructed at any time?

A. Well, on two occasions I was with the engine when we failed to get water at all. One was caused from leaves and trash and stuff that come through the mains into the strainer on the suction of the engine; and the other was from some mysterious cause that was not accounted for.

Q. When were those two you have reference to: Can you locate the time and place?

A. One was on 5th Avenue I was with the engine when it was stopped. On 5th Avenue and 13th Street when it was stopped by leaves and trash.

Q. Do you remember what fire that was?

A. It was the Loeb Mattress Factory fire.

Q. Where was your engine situated at that time?

1123 A. Corner of 13th Street and 5th Avenue.

Q. Was that hydrant upon a four inch or a six inch main?

A. I have been told it was a four inch. Of course I didn't examine the main.

Q. Now state to the court what difficulties you had there at that fire?

A. For a long while we could get water enough to develop about 60 pounds pressure with one line on it. With two lines we could not get enough water to do very much good. Of course you can't fight fire with much efficiency with less than 60 pounds pressure when the fire is burning at any rate at all.

Q. What was the pressure without the aid of the engine at that time?

A. I don't remember exactly. I looked at the gauge but I don't remember what it was. It was low. I didn't look at the record gauge.

Q. Was there any effort made without the use of the engine to get water to the house?

A. Yes, sir; we first tried a line of hose without the engine.

Q. Could you get the water?

A. We could not get water enough to do any good scarcely at all. Could not get water enough to get on top of a single story house.

Q. If the pressure had been good there would the water have gone over the house?

A. O, yes, it would have gone over the house entirely if the pressure had been strong enough.

Q. That's the Loeb fire?

A. Yes, sir.

The MASTER: The 60 pound pressure you referred to was engine pressure?

A. Yes, sir; and with one line. With two fire streams we
1124 could not obtain that.

Q. When did you have two lines from that same engine?

A. Tried to use two.

Q. What was the result?

A. We had a very light pressure and we could not put the fire out with it as rapidly as we could with one.

Q. You stated that there was another occasion when it was obstructed, when was that and where?

A. The night of the Preer fire on the corner of 15th Street and Broad. We failed to get water that night. We got a little at first and then we connected our engine and tried to get some pressure to fight the fire with but failed to get the water with the engine attached. Could not suck it out with the engine.

Q. That fire on 5th Avenue was in 1902, wasn't it?

A. Yes, sir; I think it was.

Q. What kind of service did you have there—water service?

A. I had the first stream that was on the fire and it was a pretty poor stream to attempt to fight fire with. Really didn't get any better service with my engine attached. We had to apply the engine to get any ser-ice with that one line with which to do any effective work.

Q. How many streams was turned on to that building? Attempted to be turned on?

A. At first there was only two.

Q. What was the effect?

A. Well, the water pressure was very weak, evidently, from the distance the water went. We were not able to get it on top of the back part of the house where the main bulk of the fire was.
1125 We had to lose a considerable length of time of course in getting the engine connected up in proportion to the fire and the fire had gained some considerable headway by that time. Of course the time being consumed the fire was burning very rapidly.

Q. If you had had sufficient pressure there, what would have been the result, when you got there?

A. Well, it would have made a material difference in the property lost. Would not have been nothing near like as great. Of course the fire was under headway, and a portion of it would have burned anyhow; but we could have checked the fire much sooner than we did.

Q. Did you check it at all until the house was consumed?

A. Not entirely consumed.

Q. Practically so?

A. It was a practical loss, I suppose.

Q. What was your experience at the Columbus Iron Works fire in April, 1902?

A. We had one steamer on 9th Street—had to apply the steamers as quick as we could get them there, the pressure was so weak we couldn't work without engine pressure. We applied one at 9th

reet. With that we got two lines there but nothing extra for fight-
g fire. We had one on Broad Street. We got a fair stream from
at. Another we placed on the corner of 8th Street and Front. We
uld not get water for one fire line and that engine had to be moved
Broad and 8th instead of Front and 8th.

Q. You say you could not get it from Front and 8th?

A. No, sir.

Q. How was it at Front and 9th?

126 A. Front and 9th, we got two streams; but they were very ordinary for fighting fire.

Q. Could you get those streams without the aid of the engine?

A. O, no; could not get any streams to start to fighting fire with t all until we applied the engine. As a rule we don't use the engine, nless the pressure is such that we can't do efficient work. If it is ot such, then we apply the engines; but if we can have pressure in proportion to the fire without the use of the engines, we save much more time and consequently we don't use the engine, unless it is absolutely necessary.

Q. To what do you attribute the fact that you did not have pressure at the Iron Works fire?

A. To the size of the mains and the amount of water forced into the mains. On the corner of Dillingham and Front we connected one of our first lines and when the engine started to playing from 9th and Front, we had to abandon that line entirely.

Q. Why so?

A. Well, there was not enough water coming through to reach the fire at all. I would say it didn't go 15 feet; and of course the heat was so great we could not get within 15 feet of the fire within a very short while. That line we had to take up and abandon after the steamer began to play from Front and 9th.

Q. Have you kept the records of the pressure of the fire department?

A. Well, they were kept automatically by a gauge in the station that I have charge of.

1127 Q. Have you examined those records?

A. Quite a number of them I have; and some of them I have not.

Q. Can you give in a general way what the pressure has been the last 4 or 5 years prior to the time the receiver took charge?

A. At various times it has been poor.

Q. How has it been between nine and ten o'clock in the morning and one and two o'clock in the afternoon?

A. At different times it was very weak. Sometimes it would range up tolerable fair.

Q. What was the general average during those times?

Objected to and question withdrawn.

Q. Did you prepare that list showing the pressure at those dates from the records?

A. Prepared it with assistance.

Q. State whether or not they are correct?

A. I think it is. It might vary as much as half a pound or possibly a pound one way or the other.

Q. Why do you say that?

A. Well, the way the gauge registers, a pencil mark, you would — to take a very fine pair of dividers to make accurate measurements between the lines on the records.

Q. With the exception of say a pound, more or less, they are correct?

A. I judge so, yes.

Q. Mr. Land, was that the lowest record there, between nine and 10, that the average?

A. For instance, on the 14th of January, there is 26 pounds. The pressure ranged about 26 from nine to ten A. M. on that date.

1128 Q. You say in some instances, explain what you mean?

A. For instance on Aug. 29, 1900, that's the same thing 28 to 28: For instance January, 1902, 10th day, 26 to 28 pounds. To make the average of course add 26 and 28 together and divide it by two would make the average for the hour.

Q. You say 26 would be the lowest and 28 the highest?

A. 28 was the highest between 9 and 10 A. M. that day.

Q. Where you have got these figures from 25 to 26, and 26 to 28, where that occurs, it means the tracings show that to be the highest and lowest between the hours indicated?

A. Yes, sir; during that hour the highest and lowest point during that hour.

Q. Where it is averaged?

A. Where the pressure ranged about the same thing.

Q. All the time?

A. During that hour it only shows one figure (Referring to record). I will state that this is simply an abstract. I didn't go through all the records and get all the pressures between those hours; but this is an abstract of some of the numerous ones we have.

Q. Why didn't you do that?

A. Well, it was such a tedious job and didn't have any instructions to get them all; but to get some of them. I got some from the various years from '98, including up to 1902.

Q. That's the reason, it would have taken a long time to have gotten them all?

A. Yes, sir; and I didn't assume that it was necessary, as I hadn't been asked for them all.

1129 Q. What has been the quality of the water from '90, during the various years, from that time up to 1902?

A. At times it smelled bad and had a sediment in it.

Q. How often did that occur?

A. I could not say. I didn't pay much attention to it. It didn't concern me much.

Q. How many years you say that occurred?

A. Numbers of years. Quite frequently during this period of time.

Q. Did you ever know of any fish in the mains, or in the standpipe, anything of that kind?

A. I saw a lot of them in the standpipe over by No. 1 engine house.

Q. On Broad Street?

A. Yes, sir.

Q. Did you ever catch any out of there?

A. Yes, sir; one afternoon I caught some.

Q. What did you catch them with?

A. Hook and line.

Q. How many did you catch?

A. There was a party of three of us up there and we caught seven. I don't remember exactly the number I caught. I think though I caught the majority of them.

Q. Did you ever see them in there at any other time?

A. No, I don't know that I did. I have seen them at other times before that in this standpipe; but I don't know that I ever saw them at any other place in the system.

Q. How did they get in there?

A. I could not tell that.

1130 Cross-examination.

(By Mr. WIMBERLY:)

Q. You say you just happened to get these: did you get these as a fair sample or just pick out those when it was the lowest?

A. I judge it would be, the majority of them.

Q. What do you mean by a majority?

A. I would take a month and go along and occiasionally I would skip over.

Q. You tried to get an average like a man buying fodder, weight the average bundles and then estimate the whole, did you, or did you select those more particularly when you would find them lower than usual?

A. It was the lowest ones I took, of course. I didn't take all the records.

Q. You took the lowest ones: that was your rule of selection?

A. Yes, sir. For instance: if I would take a record that ranged along from 40 to 50, I did not make any note of that between those hours.

Q. You made no note except where you found it low?

A. Yes, where it was extremely high I passed the record along.

Q. So you really did select to get the lower ones?

A. Well, not the very lowest ones. Wasn't selecting for that particular purpose.

Q. You didn't limit it to the very lowest; but you got the lowest ones in here you found?

A. I think I got most of them.

Q. Did you get any on here except those you considered low?

A. Fair between those hours.

1131 Q. I am speaking of these hours?

A. Not those particular hours.

Q. You picked out all between those hours that were not good?
A. Not all.
Q. Practically all?
A. I think I got a majority of them.
Q. If you have not got them all it is because you overlooked them?
A. No; it was quite a tedious job and I was not requested to get them all. I didn't try to get them all.
Q. You tried to get all the low ones?
A. No.
Q. Do you undertake to say that there were any other lower ones in this entire record besides these?
A. Yes, sir.
Q. You think so?
A. I don't think anything about it, I know it.
Q. You were careful not to get any high ones?
A. Yes, I didn't get the high ones between those hours.
Q. Why did you pick nine to ten and one to two?
A. It was because I was asked to get the records between those hours by the attorneys on the other side.
Q. Didn't you do some of the suggesting as to these hours or did they make the suggestion?
A. I suggested they could cut the work some after they requested it of me.
Q. To cut these hours?
A. They requested me to get these hours; and I suggested they might change it some way. I didn't like the idea of going through 500 records and getting the records from nine to 10 and one to 2 and make out these lists. It was too tedious a job and I asked
1132 if they wouldn't cut it shorter for me.
Q. Isn't it a fact that you selected these hours because from your experience and observation that these were the hours that it drops the lowest on an average?
A. No, sir.
Q. That had nothing to do with it?
A. No, sir; it was by the request of the attorneys on the other side that I selected them. I will state, to make it plainer, that some of these records that show up along about 28, 29, or possibly 30 between those hours, went as low as 10 or 15 between some other hours that same day.
Q. Those were exceptional times when it would drop down: Isn't it a fact that these are the times of day when, generally speaking, the pressure is the lowest?
A. No sir: as a rule it is lower late in the afternoon. The pressure usually falls off worst late in the afternoon.
Q. For how long a time?
A. Sometimes until 11 or 12 o'clock at night.
Q. What time do you go on duty in the morning?
A. I go on duty at six o'clock and remain until six the next morning, except three hours off to go to my meals.
Q. Well, from the time you got there in the morning, how was it from six to nine, generally speaking?

A. Well, I don't know, though it is better than it is in the afternoon?

Q. How is between six and nine as compared with vetween nine and ten?

A. I would not be positive about that. My memory don't serve me on those particular times.

1133 Q. How was it between ten in the morning and one in the afternoon as compared with between nine and ten?

A. I don't know.

Q. How was it between two in the afternoon and six at night as compared with between nine and 10 in the morning?

A. As a rule it is at its lowest.

Q. In the afternoon?

A. After two o'clock in the afternoon it continues to grow less until after night, as a rule.

Q. Do I understand you to say that you took the average through the whole 24 hours: the average would not be lower between nine and 10 than the average for the whole 24 hours?

A. Those particular dates?

Q. No, generally, all dates?

A. Well, I should think from the way they ranged why it would be less between 2 o'clock in the afternoon and two o'clock at night. During those 12 hours you might have lower pressure than during the other 12, as an average.

Q. But wouldn't the average pressure between nine and ten compare with the average pressure for the whole 24 hours.

—. I don't know. I didn't locate that fact.

Q. You couldn't say it was lower between nine and ten?

A. Some possibly might be and some might be higher, I don't know.

Q. Generally speaking you think it would vary in the average, taking one day with the other—another, there would be as much difference between nine and 10 as to the average for the whole day?

A. It would be less in the afternoon, but whether it would

1134 be enough less to make the average greater for the entire day, I don't know. I would not say without going over the records.

Q. Let's take up each of these days: Take from six o'clock to 12: How would that average compare with from nine to 10?

A. I didn't undertake to charge my memory with 365 of them in each one of those years.

Q. Have you any idea at all what hours the morning pressure gets the lowest on an average?

A. Well, I think it commences to go down ordinarily from six o'clock in the morning until 7 or 8 that night and at intervals it ranges up and down—owing to circumstances.

Q. Is there no time during the morning that it is recorded as being usually lower?

A. I don't know that there is. I would not say.

Q. Between one and two o'clock in the afternoon you don't think it is lower than after two?

A. I don't think it is as an average as low before two as it is after two.

Q. Now let's take this lowest that happens to be on top: I suppose the others are the same. Jan'y 3: You take between nine and 10 and Jan'y 4 you take it between one and two: You take it in the morning and the other day take it in the afternoon?

A. The pressure was possibly way up there and I skipped that over.

Q. When it is way up you skip it over even if you have to break into a day to do it?

1135 A. Didn't take two hours in the same days always.

Q. You get one here from one day and one from the next: I see you have several of them?

A. If I was after getting them both—you will see some of them there have both, some in the forenoon and some in the afternoon. If the pressure was good between those hours, I did not make any note of it.

Q. This is really then a record of low pressures?

A. This is a partial record of pressures. It ranged below 35 pounds between those hours.

Q. Take this first one, Jan'y 3, 1902:

The MASTER: Haven't we been over this?

Mr. WIMBERLY: No, sir; not with this witness.

Q. Take the first one, Jan'y 3, 1902, 27 to 28 between nine and 10 A. M. Let's find one to two P. M. on that day?

A. It is about 31 pounds (Referring to gauge records).

Q. The afternoon between 1 and 2 o'clock on that day?

A. It is about 34 to 38.

Q. Let's take another one of these. That's in the winter. Let's take the spring now, April 24. You have got it from one to 25, making an average of 12½ in the afternoon. Let's see what it was in the morning?

A. Between one and two o'clock it was about 32½ pounds.

Q. The general system you had was just to take these pressures below 32: that was your maximum limit. If the average went above 32 you didn't take it?

A. Quite a number below 32 I didn't get. I don't remem-

1136 ber getting over that.

Q. These hours?

A. Yes. For instance you take Jan'y 2 there. It was about 31 pounds in the afternoon, I don't think I got at all.

Q. You didn't get it because the average was over 31?

A. No. Quite a number of them I did not get.

Q. Jan'y 2nd, let's see that?

A. That's about 30 or a little above. About the thickness of a pencil mark.

Q. Without a scale you could not tell whether that is below 30 or not?

A. Yes, I judge that it is not at least over 31.

Q. It is so close that without scaling it you could have very well left that out?

A. I could have judged that if I had put dividers on it. It must be 31, possibly 30½.

Q. Isn't it a fact that the system by which you got these was that you were looking for those below 32 in those hours?

A. I was looking for some of them below 35.

Q. Did you get any of them that the maximum and minimum both were below 35?

A. I don't think I have. I don't think there is any but what is below 30.

Q. Let's see if we can find any above 30 and below 32?

A. You will find a great many more the other way.

Q. Let's take it from the first one?

A. 25 to 21.

Q. And the other is 26 to 30?

A. Yes, sir.

Q. The top one is May 4?

A. Yes, sir.

Q. You have got your maximum limit on the first day in the whole list in the afternoon: 26 to 32?

A. I suppose it is. I didn't want to go above 35.

1137 Q. Let's go on down that whole page: do you see any of them above 32?

A. No, sir; I don't see any there. I will state that 32 there might have been an error of the man doing the writing. Might possibly be some few errors there, as I did not write them all. A portion of the time I was reading and had somebody writing.

Q. Didn't make any error in getting anything above 32?

A. Don't think they did, hardly.

Q. In '99, you find any above 32 on that?

A. I will state that my instructions were to get up a list below 35.

Q. Wasn't it 32 instead of 35: refresh your recollection?

A. I don't remember, I think it was 35. They wanted the average pressures. I don't remember them saying 32.

Q. Let's take up '99—1900: you find any here above 32?

Mr. MILLER: The instructions were 32.

Mr. WIMBERLY: That's a fact?

Mr. MILLER: Yes, sir.

WITNESS: I would like to make myself a little plainer. If I had got 35 and 30, the average would not have been over 32. The question he asked me was if I was not to get all under 32; but my recollection is that my instructions were the average was not to be over 32.

Mr. MILLER: That was the instructions.

Q. Suppose it would have been 20 and 35, the average would have been 27½?

A. That would have been noted. Quite a number ranged from 30 to 35.

Q. Suppose the lowest was 15 and the other one 35?

1138 A. The average would have been about 25, I think.

Q. So as a matter of fact you were keeping your figures, as far as you could, inside of 32?

A. Yes, sir; the average inside of 32. That was my instructions. I will state further by way of information: my assistants were instructed by me, those that were assisting me, to not get them so that the average would go over 32; and I suggested that they get the numbers up to 30; and you will find a number of those sheets we sent in over 30, I think.

Q. You will find them as high as 32?

A. There is one there I notice.

Q. Let's go to the matter of fishing: How many pounds would each of these fish weigh?

—. I don't know, sir; I didn't weigh them.

Q. Were they trout?

A. No, sir; they were perch.

Q. What year was it you caught these fish?

A. I don't remember exactly.

Q. Don't remember the year?

A. No. I think it was between '90 and '96 sometime; but I don't say what year.

Q. Between '90 and '96?

A. I think so, yes.

Q. What size fish were they?

A. Some of them were as large as your hand, I suppose.

Q. Caught fish as large as your hand in the standpipe?

A. Yes, sir; I think so.

Q. Who were the other gentlemen with you?

A. John Willis and Tony Macon.

Q. Do they live here in Columbus?

A. John Willis does.

Q. You caught fish in the standpipe on Broad Street as big as your hand?

A. As large as your hand, I suppose some were. I won't

1139 say all were.

Q. That was a right convenient fishing place for the people?

A. No, sir; you would not have thought so if you had climbed up there on that ladder.

Q. How many times have you seen fish in that standpipe?

A. I have seen them several times. I don't remember the exact number of times.

Q. When was the last time?

A. I don't remember.

Q. You don't remember?

A. No, sir. In fact I will state that I have not been up there in quite a long while. At this particular time I didn't think about ever being asked about this fishing and I don't remember the number of times in regard to it or the dates.

Q. You didn't charge your memory with it?

A. No, sir.

Q. That's the only time you went fishing up there?

A. No, sir; I tried to catch some after that but they wouldn't bite. I could see them swimming around but they wouldn't bite that afternoon.

Q. That was an afternoon that was not good for fishing?

A. Wasn't good that afternoon.

Q. You have not made any effort to get the average pressure for as much as a whole day for any number of days, have you?

A. No, sir.

Q. You just picked these hours?

A. Yes, sir.

Q. You have not attempted to get it for the whole time consecutively for these hours?

A. How is that?

Q. You have answered it. I won't repeat it any more. Now then: You say you have been with the fire department as assistant chief since 1902?

A. Yes, sir; 15th of December, 1902.

Q. You were present at the Columbus Iron Works fire?

1140 A. Yes, sir.

Q. Was there any hose that broke at that fire?

A. Yes, sir.

Q. What time was it?

A. Well, those that bursted with me was late up in the night. The fire had got under considerable headway.

Q. As assistant chief you know that others bursted?

A. I was not assistant chief at that time.

Q. What year was that? Wasn't that in 1902?

A. That was in April.

Q. As a member of the fire company you do know that other hose bursted at that fire?

A. I could not say only as to the one line I saw and was on. In fact, we got a lot of hose from the company out on Rose Hill and their hose was not as good as ours and we had to use those on account of having to extend our hose on account of having to go so far with the lines and put on a lot of inferior hose, hose that was not able to stand the pressure we were playing through them.

Q. Did any of your own hose break?

A. I don't remember any bursting down town. Might have been. I would not say positively.

Q. You had a good deal of inferior hose on account of long lines?

A. We had to increase the lines.

Q. How long were those lines?

A. I don't remember the number of sections or feet. There was one engine stationed at Broad and Dillingham and I think that line reached pretty near to the bridge down on that street.

Q. How long would you say it was?

1141 A. I don't know the distance.

Q. Could you estimate it?

A. It was half way across one of the street blocks—the street and

then across two blocks and I think across to the other street to the plow foundry and possibly more extra sections.

Q. Putting it altogether, your knowledge of the localities which you are familiar with, how long yould you say that line was?

A. Well, I don't know. I suppose it must have been somewhere in the neighborhood of 1200 feet or 1000.

Q. None of the others that long was there?

A. I don't think there was any of them that long.

Q. Were the others very long lines or just ordinary lines?

A. Some of them were over the length of a block, I think.

Q. You call that a long line?

A. Well, it is a tolerable long line.

Q. The hose that broke, that in one of the long lines or one of the shorter lines?

A. I think that most of them that bursted were in these long lines that had to be lengthened.

Q. Several links bursted?

A. Yes, sir; several sections bursted during the progress of the fire.

Q. So that fire taxed you on account of being so hot and not being able to get close to it, taxed you to the full*ed* capacity of your fire apparatus so that you had to put in other hose that the city didn't own at all to fight it?

A. Well, I don't think we used any hose that the city didn't own.

1142 Q. You spoke of these old hose, the city didn't own them?

A. Yes, they were hose that were in use by the company on Rose Hill where they didn't have an engine and they are not played through with an engine of high pressure; and frequently they can use hose inferior to the ones we use down town.

Q. You had to use with the good hose *and* good deal that wasn't good?

A. I tniuk so, yes. Wasn't as good as the other; but we considered them very fair hose.

Q. Not good enough to keep from bursting?

A. No, sir. May have bursted a number of sections under the high pressure, but I don't know how many.

Q. When you speak of getting good streams, isn't it more difficult to throw a good stream that far, through a very long line of hose than through a shorter one?

A. Yes, sir.

Q. Isn't it more difficult to get a good stream when hose is old than when it is new?

A. Well, I don't think the age of fire hose makes much difference.

Q. Doesn't it become roughened?

A. On the outer surface it does. If it is on the inner surface they leak very badly and burst and we have to discard them. I don't think from the fact they are old makes much difference.

Q. In a long line of hose there are more places for it to leak, every section or every joint is liable to leak, especially if it is old?

A. We try to avoid these leaks. If we find these leaks, we go over

them and screw them up; and old couplings, as a rule, work freer than the new ones. If one gets bent, anything like that, of course we discard it and put on a good coupling.

1143 Q. Take in a long line of hose and screwing it as fast as you have to do in fighting fire, there are more or less leaks, is there not?

A. Well, when we find any of those leaks, we go over them and tighten them up again.

Q. In fighting a big fire you can't always spare a man to go over them and tighten up the leaks?

A. No; but in putting the hose on the wagon, the rule is to try to tighten them up to prevent these leaks but they do sometime leak; and sometimes we send a man back to tighten up the joints to avoid leaks.

Q. Where it is very bad?

A. Yes, sir; if they leak down the line between the nozzle and the hydrant or the engine.

Q. You spoke of changing your stream where you could not get good pressure: there was no other reason for changing the stream except failure to get good pressure?

A. Which stream do you have reference to?

Q. During that fire, those you changed?

A. The one on Dillingham? There was no other reason for it.

Q. What about the others?

A. The one on Front and 8th no other reason for it. In making these changes we had to lay a much longer line of hose than we would have had to have laid if we had gotten our engine to this hydrant, for we would have been much nearer the fire.

Q. Why couldn't you get your engine near this hydrant?

A. The hydrant would not afford water enough to supply this engine, consequently we had to retreat to larger mains to get water off from the fire and it naturally took more hose to reach it.

1144 Q. That was the only thing that caused you to move your engine to get stronger streams?

A. It was during the main progress of the fire. Later on in the fire when the fire had pretty near burned as much as it did—burned up the iron works, we had to move two of the engines on account of disability. But this was in the beginning of the fire that we had to move this engine on account of lack of water.

Q. Now then the Golden fire: where was that fire located?

A. On 5th Avenue, between 13th and 12th Streets.

Q. Between 13th and 12th?

A. Yes, sir; prety near middle way of the block, right about somewhere in there.

Q. Now then what hydrant did you get your water from?

A. We got one from there (indicating on map) and one from here, I believe. On 13th Street and one on 12th. Both of them on 5th Avenue.

Q. You got both of those from a dead end, didn't you?

A. This one is a dead end. (Indicating on map.)

Q. Is that on the same one?

A. It is between that and the main: It is *might* near the main on this map.

Q. From there out is a dead end?

A. Yes, sir.

Q. Both were on dead ends?

A. One shows to be right near the main and I would not term that a dead end, being so close; but it is on a line of pipe that leads to a dead end.

Q. What you mean by a dead end is where it gets its water from only one direction?

A. That's a fact; but this one is very near the main in that map but I don't know whether it is actually that way.

1145 Q. I am asking you as a fact without regard to its distance from where the main runs, instead of drawing its water from both ends it draws it from one end, that is a dead end?

A. Yes, sir.

Q. Both of these hydrants are so situated that the water can only be drawn from one direction?

A. So shown on that map.

Q. If that map is correct both are on a dead end?

A. Yes, sir; one on an extreme dead end and the other is where a dead end leads out from the *a* main.

Q. Both are situated so that the water can reach them only from one direction?

A. Yes, sir.

Q. Now as a matter of fact, the last one, the furtherest up here, wasn't only at the extreme tip of a dead end, but water was taken from it by another hydrant between it and the main?

A. Yes, sir; if that map is correct.

Q. On both avenues next adjacent to this dead end where you got water, that is to say, 6th Avenue on one side and 4th avenue on the other side, the hydrants ther- are not on dead ends but on mains that run through from one main to another?

A. Yes, sir.

Q. So that if you had tried to get your streams from the hydrants on 6th avenue and 4th Avenue, you would not have been much further from the fire and you would have gotten your water from pipes that were not dead ends at all?

A. That would have been considerable distance in hose.

1146 We only carry a 1000 feet of hose on a hose carriage. Another thing to be taken into consideration, the first machine that comes out 13th Street catches that plug on 13th Street which would have been nearest the fire and the first one we come to; and if we had to have gone past the fire way down here, it would have taken a great deal more hose; and if we had wanted two lines of hose, we possibly would not have had enough hose. In going to fires we have not the time to go around and hunt up the different places—different mains.

Q. You don't even know now that that is a dead end except from the map?

A. And what I have been told by the Superintendent of the water works company.

Q. Just now in testifying——

A. (Interrupting.) He did not tell me this one was a dead end. He told me that was. He told me the one on 13th Street was but he did not tell me about the other.

Q. So that is the assistant chief engineer don't even know where the dead ends are, that's one reason why it did not have anything to do with the size of the mains?

A. Nothing? I will state the assistant chief don't know whether——

Q. In other words——

A. (Interrupting.) He knows where they are but not the size and manner of construction.

Q. If you had a strong eight inch main here coupled up at both ends at equal distance from the fire and a four inch dead end, the fire company would have been just as apt to get its water from the four inch dead end as from the 8 inch main, because he does
1147 not know which is which?

A. Well, it depends upon the locality of the fire and the fire hydrant and what direction he comes from, of course.

Q. Depends entirely upon that?

A. Yes, sir.

Q. The size of the mains has nothing to do with it?

A. Under extraordinary circumstances it does.

Q. Under extraordinary circumstances you don't even know——

A. (Interrupting.) No, if there is a*n* vacant plug we catch the first one we come to. The presumption is that there is water there and that there is plenty to supply a fire stream or the fire plug *or the fire plug* wouldn't be there and consequently will expect to work from that plug. If it is more convenient to the fire and takes less hose and less time to operate it from that plug.

Q. If they are both equally convenient and you were to get to the one on the small pipe line first, the dead end, you would use that instead of the other one that was just as near the fire on the bigger pipe?

A. It would depend upon what direction we were coming from.

The MASTER: What you mean to say is, that the fire company puts their hose at the first hydrant closest to the fire, that what you mean?

A. Provided there is no other company using it. I will go on further to state that the engine companies try to get on the largest mains that are not occupied. If they were to find a smaller one occupied here and a larger one over there with a line of hose
1148 leading from it, the engine goes to the largest main, if he knows it.

(Mr. WIMBERLY:)

Q. But you don't even keep up with where the larger mains are?

A. Most of them. These small ones, minor ones like dead ends, some of them I am not thoroughly familiar with.

Court here adjourned until the next day.

THURSDAY MORNING, *March 2nd*, 1904.

Court met pursuant to recess and the hearing was resumed:

Examination of witness A. J. LAND, resumed by Mr. WIMBERLY:

Q. Will you let me have those lists you had the other day?

A. Before we go into that I would — to make an explanation in regard to a question you asked me yesterday in regard to the hose at the Columbus Iron Works fire other than belonged to the city. After refreshing my memory I do remember on the line from 8th and Broad, we had some Columbus Iron Works hose in that line. I found them there. In the meantime I had forgotten that. It seems to me that I told you on yesterday that we did not use any.

Q. Right on that question: isn't it sometimes true, without regard to the main, that you can't get enough water through your hose to supply your engines?

A. I have never seen a case of that kind. It is a matter of fact that if we can't get the draught to draw it we can't get the water. If the water is there, we can get it in proportion.

1149 Q. The hose even at times when there are no leaks and no roughening on the inside, has only an opening of 2½ inches?

A. Where do you mean?

Q. The clearance, not speaking of the nozzle, but the hose inside—the clearance?

A. Yes, 2½ inches.

Q. So it does vary by the squares: if it was as smooth on the inside as on the inside of a pipe, it would not give you but about one third as much water as comes out of a four inch pipe?

A. You mean plain line of hose or with the engine attached?

Q. I mean the hose when the engine is forcing water through it to reach a fire?

A. Well, we can force through 2 or 3 lines.

Q. I am speaking about one line?

A. One line is 2½ inches; and an engine can't well deliver its full capacity through two and one half inches with an inch and an eighth nozzle. It can't do it.

Q. In other words the size of your hose limits the size of your stream that could be put through even at very high pressure?

A. Yes, sir; limits the amount of water.

Q. There is a section of hose, is there not, between the engine and the hydrant?

A. Yes, sir.

Q. What is the size of that hose?

A. It is about 5½ inches: but it is reduced down at the hydrant for a distance of about possibly two inches, something like that—very short distance, to 2½ inches in diameter.

Q. They have to do that because the hydrants are only 2½ inches?

A. Yes, sir; these here.

Q. That's the usual size of hydrants?

A. I have seen them at other places the size of the
1150 suction to the engine.

Q. Have you ever worked for a fire company at any other place?

A. No, sir.

Q. What places do you refer to?

A. I have seen them in Savannah, it seems to me like; but I won't be positive, but I think Birmingham too; and I think they are that way in Chicago.

Q. Now the section of the pipe to the engine, is that a long pipe or a short pipe?

A. Well, it is not a very long one. I suppose it is 12 feet may be a little longer or a little shorter.

Q. Isn't it true that at the iron works fire that you got a pressure of 110 pounds and the engine broke down?

A. I could not say that.

Q. Isn't it a fact that that engine has previously been found to be incapable of taking 110 pounds pressure—100 pounds pressure; and that on that night you broke it down by running it up to 110?

A. A. I don't understand: You mean pressure on the pump or boiler?

Q. I mean the pressure of the engine sufficient to produce 100 pounds water pressure?

A. You mean steam pressure sufficient to produce it?

Q. Yes?

A. I never heard of it if it had: You have reference to the older steamer, the one that broke down late in the morning?

Q. Yes?

A. I will state in reference to that that it was a minor breakdown. It was the feed that broke down on the old engine—boiler feed.

1151 Q. How about the other engine?

A. The other engine, that happened early in the morning. I think it was directed on the warehouse fire at the time it broke down.

Q. What was it that broke down about that?

A. The casing came loose that protects the gearing and got between it and stripped some of the gearing.

Q. How many sections to this suction pipe that draws the water from the hydrant—the source of supply?

A. Only one section.

Q. In other words, you try to draw enough water through one section of pipe which is only 2½ inches through to furnish two 2½ inch streams?

A. It is reduced down to 2½ inches right where the connection is made to the plug. If the source of supply is great enough, that is sufficient to supply the engine with its capacity, which is 600 gallons per minute for two fire streams.

Q. You spoke of its being reduced down to 2½ inches at one end: the smallest end is what limits the capacity of the pipe?

A. Yes, sir. If that suction was the same size all the way from

the hydrant to the engine, it would have a considerable different effect.

Q. Have more *friction*?

A. Yes, sir; you would not get the resistance.

Q. At the same time while you can relieve some friction by having one end bigger in size, the smallest end is what limits the quantity of water that goes through it?

A. Yes, of course it can't go more than the capacity right at that particular point.

1152 Q. In your 1900 report here, I notice in one place, I believe it is January, where the pressure is put down as nothing: Will you find me that? Jan'y 21, 1900?

A. You see it ranged down below that line there at one o'clock and staid until about ten minutes past two.

Q. Then it was nothing?

A. During that period of time there was no pressure.

Q. You have got it marked on the margin "cut off for repairs?"

A. Yes, sir.

Q. It staid cut off during the 22nd, didn't it?

A. I would have to look to see.

Q. Look and see how long it staid cut off for repairs?

A. No, it only staid cut off there I think about an hour and ten minutes.

Q. No, the other was on the 29th. So at the time you have put here at zero, as a matter of fact the pressure was cut off for repairs?

A. Yes, sir; I suppose so.

Q. At that point?

A. Yes, sir.

Q. Still you put that in to show what the pressure was on that day?

A. Yes, sir.

Q. Does your gauge show it was cut off for repairs and had no pressure in it at all?

A. The repairs was on the main.

Q. The main that led to the gauge?

A. I will state that I overlooked that in making up this list.

Q. You overlooked that, did you?

A. Yes, sir.

1153 Q. Let's see if there was any more overlooking done?

A. I will state in regard to these records, in getting them up, we are liable to make some mistakes, such a large quantity of them.

Q. This is Jan8y 4 you are on?

A. That's third and 4th.

Q. Suppose you look at the beginning and see where the pressure first begun?

A. Here is the afternoon of the third: It went down to about 12:30; and then staid down until about three o'clock—viberated up and down there.

Q. Wasn't it cut off during that time?

A. I don't know, sir.

Q. Jan'y 3rd has been taken out?

A. That is the third we are looking at now; but that was the afternoon of the third this was down that way.

Q. Let's see the one that was taken out and see if that won't be the fairest way of getting at it; I will get you to please find it. You may have taken it out in examining it. I will get you to find me that slip of January——

A. (Interrupting.) I would like to state for your benefit, if there are any errors it will show up in these records and it is not intentional on my part. It was by accident that it happened. I will state here how that is: Here's the afternoon of Jan'y 3rd—the latter part of it. This is 12 o'clock, Jan'y 3rd; and it goes to about 12 o'clock at night, which is the beginning of Jan'y 4——

Q. Where is the one that is taken from? We want the one where it shows that it was cut off for repairs—its shows that it was

1154 still cut off for repairs.

Mr. WIMBISH: We are willing for it to go in that way if the gentlemen saw it. If the gentlemen say they saw it marked on there, we are willing for it to go in the record that way?

Q. Is it not true that whenever the pressure drops down that way, it is some temporary cutting off, either of the pipe or of the gauge for repairs?

A. I would suppose that it was when it dropped that low.

Q. Because any kind of water would make some kind of a record, even if it was not but a pound or two?

A. Yes, sir; unless there was a draft on it that would relieve it of the pressure; but ordinarily it would more or less show up some pressure.

Q. Even a draught would relieve it if it was cut off for repairs?

A. Cut off the source of it it would relieve all the pressure.

Q. That could not last all day or even an hour?

A. Not hardly. It might.

Q. Where you have got it zero, it was where they were making repairs on the main or the gauge?

A. It might have been repairs at the standpipe. Might have been repairs at the pumping station or some other place. I don't know where those repairs were.

Q. I notice one of these has been rubbed out, Feb'y 6: Will you let me see that report that was rubbed out?

A. I will state it was some figures 26 to 30 must have been rubbed out on account of my having said A. M., 26 to 30, while it ought to have been 26 to 30 P. M.

Q. Let's see what it was?

A. Feb'y 6, 1900.

1155 Q. Take this other day when you got nothing, also marked on there standpipe cut off?

A. Yes, sir; it is on that one. I don't know whether it is marked nothing or not.

Q. What year is this?

A. 1900.

Q. Will you explain that rubbing out on there: What was it in the morning?

A. In the forenoon it ranged from about 28 or 29 to—right there it crosses——

Q. At nine?

A. Between nine and ten, up to about 34, I will say, 33 or 34; but I think, as I have stated before, which will explain that rubbing out, it should have been afternoon instead of forenoon, as the record here in the afternoon shows that about 26 to 28. I think that was the reason it was rubbed out.

Q. Isn't it a fact—refresh your recollection, that the reason it was erased was because the higher figure was over 32, 34?

A. It was not.

Q. See if that wasn't 34?

A. No, looks like 30—looks like 26.

Q. Isn't it a fact on this day when you have got 26 to 30, it had just before that been cut off for repairs and they hadn't been able to run the pressure up: It takes a little time to restore pressure after it has been cut off?

A. I do not know about that. I would not like to say.

Objected to on the ground that the records themselves show when they were cut off.

1156 Q. It is a fact that it is marked at that particular time, opposite these very hours, standpipe cut off?

A. Yes, sir; but in a different hand from the date. I don't know when that was done. I don't know whether it was done when I took these records or not.

Q. You know you have had control of them all the time?

A. No, sir; not since they have been in the court room. I left them here.

Q. Do you know whose handwriting that is?

A. I do not.

Q. You know the stenographer didn't do that?

A. I don't know who did it; but it is an evident fact that it is in a different hand from the date of this record. I would not say that was on there before or not.

Q. The other is done in a different handwriting and evidently it is the work of a different person?

A. Yes, sir.

Q. And was put on at different times: This was put on at that hour and was put on with a pencil when it was filed away?

A. I won't say when it was put on.

Q. In the same writing as the others, standpipe cut off?

A. No, sir; I don't think so. Don't look like it.

Q. You think it has been put on since?

A. I would not say. It is possible it was there or it might have been done since.

Q. After the standpipe wasn't cut off, it rose until it got up to between 40 and 50?

1157 A. I could not tell when it was cut off.

Q. After the place where it is marked cut off on the slip, it rose to between 40 and 50?

A. I presume it to have been cut off all day, that is, half of the day. It is written on that side. It varies. Might have been the standpipe was turned on at other times on account of the pressure varying.

Q. Isn't it a fact that on the gauge record for the date about which I have been asking you, the earliest part that you got your record on, one and two o'clock, the standpipe was cut off: Now if you will look later during the day you will find on that same day where the pressure continued to rise until it got to where it was 40 and 50?

A. This portion is all right in that hour; but I don't know whether it was intended to account for that hour or during the day.

The MASTER: What date is that?

Mr. WIMBERLY: Feb'y 6, 1900.

WITNESS: Yes, sir.

Q. Now the writing is in the space between one and three o'clock, isn't it?

A. Yes, sir.

Q. Don't you know who did that writing?

A. No, sir.

Q. You don't have any idea whose handwriting that is?

A. It is a back hand and a lot of people write that way.

Q. Don't you know who writes a backhand where these records are kept?

The MASTER: He says he don't know who wrote it. I un-

1158 derstand you to say you are the keeper of these records?

A. They are in my charge in my office.

Q. Who dates the pencil dates on them?

A. Mr. King usually does personally.

Q. Who is in your office that makes the other entries like standpipe cut off or any others, who usually does that?

A. He does personally.

Q. No one else?

A. In case he is absent the man who fills his place does it for that time.

Q. Mr. Land, there was an investigation of the matter of the Preer fire was there not?

A. Yes, sir.

Q. Who conducted that investigation?

A. I don't remember, the different aldermen, I think.

Q. Don't you know?

A. And the mayor.

Q. Don't you know after the investigation was over the matter was dropped without making any complaint to the water company?

A. I don't remember any official complaint being made. It seems that the fire committee—Mr. Foley was a member of it and the water company held an investigation, not sure; and after it was over, I know they went on and didn't have much more to say about it—in kind of passed off.

Q. What time of year was that?

A. I think it was along in the Fall, not sure—might have been in the Spring.

Q. They celebrated that year, Monday, for the first of January, didn't they, on account of the first falling on Sunday, and this was Monday night after the people had started to celebrating?

1159 A. I think so. Not positive about it. I don't remember what month it was.

Q. What time of night was it?

A. The fire started I think—I don't remember the exact time of night, but I know I was sleep in bed when the alarm came in.

Q. Early hours in the morning?

A. Yes, after midnight, I think, sometime before it started.

(By the MASTER:)

Q. Where are the slips that you made that list from?

A. They were on these files when I brought them into court.

Q. When did you bring them into court?

A. Monday morning.

Q. Where have they been since?

A. Been in charge of Mr. Palmer.

Q. All of them?

A. Yes, sir; all of them.

Q. When did you make that list?

A. I made that list Saturday and a portion on Sunday.

Q. Just passed?

A. Yes, sir.

Q. You brought all the slips here that you made that from?

A. All I made that from.

(By Mr. WIMBERLY:)

Q. Find me the 30 and 31st of Jan'y, 1900?

A. I don't see either one here.

The MASTER: Didn't you make that list from them?

A. Yes, sir; may have lost that one. I see one is badly worn here. Here's Jan'y. 29 to 30, 1900; and it may be that the other two have slipped off the wire from handling. Says Frozen from Jan'y. 29th to 30th, 1900.

1160 Q. Read that closely, doesn't that say frozen from Jan'y. 29th to Feb'y. 3rd?

A. Yes, sir.

Q. Where did you get the record for Jan'y. 30th and 31st, if there was no record kept between Jan'y 29th and Feb'y 3rd because it was frozen?

A. I can't account for the mistake. Just a mistake in dates putting them down. I can't account for it unless it was marked that way. I didn't do the writing. I would read and have a man to write for me. When I said nothing, passed along and in going through this way, I might have read zero and he might have put down "0" when I didn't intend for him to do it.

Q. Isn't it a fact, in order to give us a perfectly candid answer,

isn't it a fact that when you examined there, you found that for four days it was frozen, and from your knowledge of the register, no record was kept while it was frozen, it registered nothing during those four days because it was frozen?

A. I will state in making out this list I didn't expect to swear to it. I thought it was a memorandum for the attorneys to refer to for these records and I did not give it the attention that I might have on these particular things. I simply told a man to write them down for me as I would read them; and when I got here possibly I said nothing and he wrote down zero there when I didn't intend for him to do it.

Q. Isn't it a fact, that when you prepared this list, you knew that it registered zero from Jan'y. 29 to Feb'y 3rd, because it was frozen and could not register and you put it zero, leaving the
1161 court under the impression that it was the fault of the system and not the impossibility of making a register?

A. No, sir; I did not intend that.

(By the MASTER:)

Q. Are you prepared to say that that paper there, that list that Mr. Garrard has in his hand, is an exact, accurate transcript of these records made by you?

A. No, sir.

Q. Or made under your supervision?

A. No, sir. I dictated but I did not watch the pen of the other party.

Q. You are not prepared to say that this is an accurate transcript of the records?

A. No, sir.

(By Mr. WIMBERLY:)

Q. Isn't it impossible for you to have taken up one slip that had no register at all, reaching five days, from Jan'y 29 to Feb'y 3rd and read out something that your clerk would take down, five days, twice a day?

A. I might have told him from the 29th to the third nothing, and he wrote it down expecting that I wanted it that way; but I didn't intend for him to do it.

Q. Who was your clerk?

A. I think Broadnax wrote that one. Changed about. You will see it is in a different handwriting. No clerk; but one of the boys assisted me in this work.

The MASTER: That paper was tendered here by the other side. I suppose they intend to offer it in evidence when they get through with this witness.

1162 Mr. WIMBISH: Merely as a memorandum.

The MASTER: Mr. Land comes now and admits that there are a great many inaccuracies in that paper; and in view of that fact, I don't think it is admissible in evidence.

Mr. WIMBISH: We don't think they are admissible in evidence.

Q. Isn't it true, that every one of these fishing expeditions, the times that you went fishing, was in '95?

A. I would not be positive about what year it was.

Redirect examination.

(By Mr. MARTIN:)

Q. You were asked by Mr. Wimberly with reference to the investigation of the Preer fire?

A. Yes, sir.

Q. Who did you say was at that investigation?

A. I think it was the Mayor and the Board of Aldermen.

Q. What investigation was had—what was the line of investigation?

A. We had to go before this board and tell the circumstances of how it happened and the reason we had to move our engine from 15th Street down to 14th Street to get water, on account of not getting water at the corner of 15th Sreet and Broad.

Q. Were any firemen discharged on account of their conduct on that night?

A. No, sir.

Q. Any firemen drunk on that night?

A. None of the paid men. Some of the volunteers might have been. I presume they were.

Q. Well, the firemen that had charge of this plug and
1163 this apparatus, were they drunk or not?

A. They were not drunk.

Q. What connection did Mr. Foley have with the investigation?

A. I think he was a member of the fire committee.

Q. He was an alderman at the time?

A. Yes, sir.

Q. Did he make any statement to you with reference to that fire—any complaints against the water company?

A. He came to me about it, before the investigation, on two occasions and told me that he thought somebody was liable to lose their job about it; but he didn't say who it was.

Q. He was a director in the water company also, was he not?

A. I think so.

Recross-examination.

(By Mr. GARRARD:)

Q. Did you notice anything in Mr. Foley's actions at that time or any other time, that indicated any bias on account of his being a director of the water company?

A. I could not say that I did.

Q. Wasn't there a good many others on the committee besides Mr. Foley?

A. I think there was three others on the fire committee.

Q. Who were they?

A. I don't remember. I don't say positively that he was. It seems like he was.

Q. Who else conducted the investigation besides Mr. Foley?
A. I think the Mayor and Mr. Bush and Mr. Joseph and I believe—I forget. It has been so long; and I never expected to be called on to state.

Q. Ain't you mistaken as to Mr. Foley's being an alderman
1164 at that time?

A. I think he was on the fire committee and an alderman, I am not sure.

Q. You say you attempted to get water out of the plug at the corner of Broad and 15th Street?
A. Yes, sir.
Q. You dropped back to the block just south of that?
A. Yes, sir; one block.
Q. Don't you know that fire plug south of there is on the same line—same main as the fire plug on the corner you refer to?
A. I have learned since it is; but Mr. Tuggle told me that the one on 15th Street was a dead end.
Q. The one on 15th Street?
A. Yes; and that the other one was not.
Q. Don't you know that there has been a main running from Broad Street on 15th Street out that Street for a period of time long before this Preer fire?
A. No, sir.
Q. Don't you know in point of fact that it was not a dead end at Broad Street?
A. No, sir; the only information I had was from Mr. Tuggle.
Q. Don't you know that the water company objected to that plug being touched at all until it was thoroughly examined?
A. No, sir; I do not.
Q. Don't you know it was opened after the fire and the water flowed perfectly freely?
A. I was told so, yes, sir.
Q. Didn't you go there and see it?
A. No, sir.

1165 Q. You didn't want to see it, did you?

A. If I had known it was going to be tested I certainly would have seen it.

Q. The plug you all got water from was below that one block on the same main?
A. Yes, sir; one block below that.
Q. You got plenty of water there?
A. Yes, sir.
Q. You say something was said about somebody losing their place: never heard about that before?
A. It was a conversation between Mr. Foley and myself on two occasions previous to this investigation. He questioned me very closely about it.
Q. Why did he indicate that they would lose their places?
A. I don't know. He might have thought if we were in error, I presume, was the idea, we would lose our job.

Q. Did he mean error as to your thinking material or as to your condition?

A. It came about in this way: He went on to say that it was impossible for such a thing to happen and I told him that it did happen any way; and he said that the water works company had a man that they considered an expert and a competent man and he said it was impossible; and he says "I expect somebody is going to lose their job about it."

Q. Why did he say they would lose their job?

A. He didn't go into details to explain why.

Q. Did any of them lose their jobs?

A. No, sir; not about that.

Q. Didn't they just conclude that they would condone it and let it pass over, wasn't that what was told you: just let the
1166 matter drop?

A. It wasn't told me by any of the officials. I don't remember it having been told me at all; but I know it took that course, went on and died right there, after the investigation.

The MASTER: All the testimony of this witness with reference to the list purporting to be a transcript of the gauge records, is ruled out.

1167 R. W. LEDSINGER, re-called and examined by Mr. GARRARD:

Q. You have had charge of the flushing of the sewers have you not?

A. Yes, sir.

Q. At what time in the day did you flush these sewers?

A. Generally commenced a little after dark—early part of the night and from that until 10 or 11 o'clock at night.

Q. And you continued it until such time as you though-

A. Yes, sir; until we thought necessary where we have got to flush.

Q. Did you have the hydrant connections cut off when an alarm of fire was given?

A. Yes, sir.

Q. That has been your custom?

A. Yes, sir; my instructions from the chief of the fire department and the water works company both, whenever there was a fire alarm rung on to cut off my water immediately.

Q. What was the object in cutting it off?

A. I suppose so that the fire department could get the pressure.

Q. You don't give that your personal attention?

A. Yes, sir; most of the time I am with them.

Q. You have two very competent men?

A. Yes, sir; I have my son watching a great deal of the night or somebody else always there.

Q. Don't they turn the hose on very frequently and go to supper?

A. No, sir; always somebody right there with them. Never do go off.

Q. To see that the city does not suffer by lack of pressure
1168 by reason of flushing sewers?
A. No, sir.
Q. How do you flush these sewers?
A. Well, we have two sections of hose to a plug; and then have a stopper to stop up the hole of the sewer, both ends with plank and then pull the stopper and let the water go through.
Q. You fill the sewer up with water from two or more plugs?
A. Sometimes—two openings.
Q. You have the sewer stopped up with two planks?
A. Sometimes have three.
Q. How many openings do you use?
A. Two at one hydrant. Both open at one hydrant.
Q. Do you have a nozzle on the hose?
A. Open it up, full 2½ inch streams.
Q. You continue that all night?
A. Say up until ten or eleven o'clock, sometimes earlier and sometimes later.
Q. Whenever a fire alarm is sounded you cut it off?
A. Yes, sir; immediately.
Q. And in a few minutes the pressure is restored?
A. Yes, sir; I suppose so.
Q. Do you re-call when the city commenced to flush these sewers—when they took charge of it?
A. Been flushing before I was sanitary inspector, when Mr. Williams was sanitary inspector. I was elected in '93—took office in '93 and they were flushing them then for sometime.
Q. Don't you know the water company did it for awhile?
A. Done it themselves, yes, sir.
1169 Q. Received $600. a year for it?
A. Yes, sir.
Q. From the city?
A. Yes, sir.
Q. And they required it to be done by the sanitary inspector so as to save that amount?
A. To save that amount of money.
Q. The flushing is greater in dry weather than at any other time?
A. Yes, sir; flushing all the time in dry weather, every night. When it rains hold up a few days until the sewers commence to smell bad again.
Q. There is no hose nozzle used at all?
A. No, sir.
Q. Two full streams from 2½ inch hose?
A. Yes, sir.

(No cross-examination.)

1170 C. E. ESTES, sworn by the respondent, testified as follows:

(By Mr. MARTIN:)

Q. You are a citizen of Columbus?

A. Yes, sir.

Q. How long have you been a resident of the City of Columbus?

A. More than 50 years.

Q. Have you been a resident here constantly since the water works was built in '82?

A. I think during that time I had been absent perhaps—couple of years perhaps.

Q. What year?

A. One year continuously, that was about four years ago. I was absent from the city 12 months. Have only been absent 12 months since the water works has been built.

Q. What has been your opportunities for knowing the condition of the water furnished to the City of Columbus by the water works company since they were built?

A. As a constant user of the water and I was appointed on a committee once by the City Council to investigate the matter. That was a good many years ago.

Q. Do you remember about what year that was?

A. I don't remember the year, not expecting to be called up here and I have not refreshed my memory in regard to dates but it has been a good many years ago. It was when Mr. Rankin was a member of Council; but I could not tell you how many years it was. It was pretty early in the history of the water works trouble I know.

1171 Q. What has been the character of the water for drinking and domestic purposes furnished by the water works company since '83?

A. During the summers I would think it was almost continuously bad.

Q. That be the case almost every summer?

A. Yes, sir. Winter months I think the water was all right.

Q. How would it be in case of dry weather?

A. Then the water was bad. That's what brought about the investigating committee that I acted upon at one time when I spoke of the bad condition of the water—unsatisfactory condition of the water.

Q. State whether or not when you were on that committee the water works company claimed to have a filter

A. Yes, sir; that was my understanding, that they had a filter there. I looked into that matter when I went over there.

Q. Did they have?

A. None there, no, sir.

Objected to his understanding, unless he knows it.

WITNESS: I got it from the contract. That's all I knew about it—general information.

Q. Did the water works company or the officials of the water works

company claim at that time, when you commenced your investigation, that they had a filter?

A. To the best of my knowledge they did, otherwise I would not have looked into the matter.

Q. What was the result of your investigation on that line?

A. I found a sieve, looked like a boiler with holes punched into it; and the man in charge of the water works at the time told me
1172 that was the way they filtered the water.

Q. Wasn't that in '94 when I was a member of the committee: wasn't I (Martin) a member at the same time?

A. Yes, sir; the same time.

Q. Now did you go out to the water works reservoirs?

A. Yes, sir; went out there twice.

Q. What was the condition of the water in the reservoir at the time you went?

A. Well, the upper reservoir the first time I went was almost empty, very little water in it and not much water in the lower reservoir. In the upper reservoir there was decayed vegetable matter, green mould on it, bad smell to it, tadpoles and such things as you usuall- find in an old pond of water. It made the impression upon my mind of an old deserted mill-pond, without a dam to it. There was a very thin stream running into it. I could stop it up——

Q. Do you remember what year you found that condition?

A. As you stated, it was about '94, I believe.

Q. July 5, '94. Did you visit that reservoir then any years later than that when you were not on any committee?

A. I went another time, I think it was a little later than that with a gentleman that had a buggy and horse that wanted to go over there to see the condition of it. When we went over there they had quite a number of hands employed there rolling the mud out of the upper reservoir cleaning out the place piled up on the edges of the reservoir.

Quite a considerable number of hands at work on it. It was
1173 in a foul condition at that time, almost no water at all in the upper reservoir, just a thin stream was running through it; and very little water in the lower reservoir. The impression on my mind was that the water was being pumped into the pipes from the river. I didn't see how that quantity of water could supply the city what it was using at that time. I didn't think it did and I don't think so now. Could not say of my own certain knowledge; but I have since learned that there was a pump at another place.

Q. Do you remember going out there in '98?

A. As to dates I could not be sure. I went out there on 2 different occasions but as to the time I don't remember. I have not refreshed my mind on any of these things; but I went out there twice—am sure, positive about that.

Q. Were you here in 1902?

A. Yes, sir.

Q. What was the character of the water furnished the people then?

A. Bad as it could be. I think it was worse that year than I have ever known it to be. That's the year we were buying water here.

Q. Do you know about what time the drought set in in '02?

A. No, sir; I don't remember.

Q. Do you remember about what time the water gave out over there, got to smelling bad and we had to use river water?

A. Must have been pretty early in the summer. I know the summer of that year the water was something awful.

Q. What was the rain fall in the early part of that year, was it heavy or not, in 1902?

1174 A. I don't know.

Q. That was the year the bridge was washed away, wasn't it?

A. I don't remember about that. I remember the bridge was washed away—no, it was before that time that I noticed the pressure in the pipes for fire purposes. It was previous to that. I don't remember about that.

Q. You ever attend fires in the city of Columbus?

A. Yes, sir; I have.

Q. Were you — a position where you could observe the effect of the pressure?

A. Well, I re-call three occasions that I did when I was present when they could not get water from the pipes. I went by and saw the hydrants open but they could not get any water.

Q. Where was that?

A. One was here in the lower part of the city where Captain Bates lives now. The fire was down there a good many years ago; and I remember all during that fire all they could get was a little muddy stream coming through. I remember distinctly seeing them unscrew the top but they could not get any water. It was one of Capt. Bates' houses—may have been the Bates' property—I know it was close to his house.

Q. Do you remember the year?

A. No, sir.

Q. You spoke of some other occasions?

A. Some little houses burned in the southeastern portion of the city they could not get water to throw it over the houses, little one story buildings. Present at that fire; and on Broad Street,

1175 the Preer fire, I saw that plug opened there when they tried to get water from it but didn't succeed in doing it.

Q. Didn't succeed in getting water?

A. No, sir; I asked the firemen why they couldn't get water; but I don't remember his reply, think probably it was stopped up with mud. Didn't get any water. May have been a little stream I saw. I may have seen other fires but I am not sure about any other times.

Q. Doctor, suppose at any time since '85 or '86, after the people got to using this water, if they had cut off this water so that the people could not use it, what condition would they have been in with reference to water for domestic purposes?

A. About as bad as could well be—been without water, practically.

Q. State whether or not they abandoned their wells after the water works was constructed?

A. Almost universally. May have been a few wells left.

Q. When the water was cut off in '02, how did they get water?

A. Bought it. Had it brought to them and they bought it. That's the way I got water and others got it the same way.

Q. Do you know how long that condition lasted, when it began and when it ended, that people had to buy their water?

A. My recollection is that it lasted well into the Fall, until the winter months perhaps. I heard that some bought it way into the winter months, afraid to use the water. I did not. As soon as they got the river water or rather the rains fell, we used the water as usual.

Bought a filter and filtered it a long time in my own house.
1176 Wasn't fit for domestic purposes and filtered the water. After that it was all right.

Q. After you filtered it?

A. After I bought my own filter—used a private filter for some time. Could not use it otherwise. After they built the filter I think the water has been all right as far as appearances are concerned.

The MASTER: Do you use the water now?

A. Yes, sir.

The MASTER: What is the character of the water now?

A. I think it is all right.

Cross-examination.

(By Mr. WIMBERLY:)

Q. You say you bought you a filter?

A. Yes, sir.

Q. The water company furnished filters to people who requested them?

A. Not that I know of. I saw one they wanted to sell me. It was a little bit of a thing not as large as I wanted.

Q. You got a large filter?

A. Yes, sir.

Q. How much did it cost?

A. I think it was about 30 gallons a day. Cost me $10. or $12.

Q. The largest filters cost as much as $5. or $12?

A. Mine was about 30 or 40 gallons.

Q. What was the price of the small filters you spoke of?

A. Think it was about $5. I could have bought one like it for $5.

Q. The committee that you were on did you ever call upon the water company to provide a filter or to filter the water?

A. I suppose not. That was covered afterwards in their
1177 report to council.

Q. Isn't it a fact that Mr. Ramkin, yourself and others connected with this investigation made at that time, had in mind, not to correct the evils of this water system, but to build a water system by the city—municipal ownership?

A. I don't say anything for myself; but I don't think the men I was associated with was that character of men at all. I say nothing for myself, however.

Q. Don't you know at that time there was a plan actively on foot to reject this contract as not binding upon the city?

A. I presume it was on the ground of inefficiency.

Q. Don't you know the ground was that it had not been submitted to a popular vote?

A. Not that I know of. The ground then that was stated was inefficiency—didn't come up to the contract.

Q. Don't you know the water works company made earnest efforts to get the city to state what it wanted in the way of service; and that the city declined, because it said the contract had not been submitted to a popular vote and was not a good one?

A. No, sir; I didn't understand it that way.

Q. Who selected you on that committee?

A. City Council.

Q. Council during the time alderman Rankin was a member?

A. I think so. That's my recollection.

Q. In '94?

A. Yes, sir; that's my recollection. I was appointed as the other members of the committee were, as far as I know.

1178 Q. You are the only physician that was on the committee?

A. I believe so, yes, sir.

Q. Has Columbus a board of health?

A. Yes, sir; think it has always had.

Q. You a member of that board of health?

A. No, sir.

Q. You, as a member of that committee, took no steps to have the water analyzed or investigated as to its wholesomeness?

A. Well, I didn't think it was necessary. It did not take an expert to see the condition of the water.

Q. How has the general health been in Columbus for the last 20 years?

A. I think it has been fairly good.

Q. Compares very favorably with other cities?

A. I think so.

Q. And has during the whole time?

A. I think it has as far as I know.

Q. You have never had anything like an epidemic of sickness during the whole time?

A. I have understood they have had some fevers during these times. Good deal of typhoid fever; but not being engaged in the practice I don't know.

Q. They have those in every city the size of Columbus?

A. Well, not always. Some have typhoid fever.

Q. Columbus has not been especially subject to typhoid fever?

A. No, sir.

Q. The first two fires you mentioned, were they before the Preer fire?

A. I think they were before the Preer fire. The fire down in the lower part of the city near Captain Bates' residence, may have

1179 been his property but I am not sure. It seems to me that was the first fire my attention was called to.

Q. How many years ago was that?

A. I don't know. I could not tell you that.

Q. Approximate it?

A. I imagine about 12 or 14 years ago.
Q. Some years before you were on this committee?
A. No, it was afterwards—I think it was afterwards.
Q. Then it was less than 12 years ago?
A. Yes, it may have been just about that time. I know the reason I was watching it there had been complaint made which came from the chief of the fire department that the pressure was inefficient. That was long before I went on that committee. That was Mr. Burrus.
Q. What's your best recollection as to the time of these fires you spoke of, was it before or after you were a member of this committee?
A. Well, I could not tell you. I think my attention was called to it by the report of Mr. Burrus before I was on the committee. May have been called to it by my taking part in that investigation; but I could not be positive.
Q. You are not sure enough to undertake to say?
A. No.
Q. These little houses that you spoke of in the eastern part of the city, what houses were those?
A. I don't re-call the house. Little one story houses over in the southeastern part of the city.
Q. Near the extreme limits of the city?
A. It seems to me it must have been 7th or 8th street between First and Third avenue-, along in there. I don't remember
1180 who the property belonged to.
Q. Do you remember when the fire was?
A. No, sir.
Q. About how many years ago?
A. It is guess work: It must have been 12 or 14 years ago.
Q. It was before the other fire you spoke of?
A. No, sir; it seems to me it was later.
Q. Your best recollection?
A. That's my best recollection.
Q. The other one you spoke of was the Preer fire?
A. Yes, sir; near where I lived. Happened to run up to see that.
Q. As a matter of fact from the first hydrant they did not get any water?
A. Didn't get any water at all. Might have been a little water leaked out of it; but no water for fire purposes.
Q. Isn't it a fact they didn't get any water?
A. Possibly not. Didn't get any water to put on the fire. I asked the firemen why it was they did not get any water and I think I was told the plug was stopped up with mud or something of that kind. Saw the hose laying there but didn't seem to get any water through them.
Q. Don't you know they went back afterwards and found it threw water all right?
A. I was not there then. I don't know where they got the water to put out the fire.
Q. They did get water from another faucet?

A. Somewhere, the fire was put out. Wasn't far away and just happened to see that.

1181 Q. Are you familiar and have you had an occasion to investigate the matter of fighting fires and the conditions that exist in the successful use of water?

A. When I was a young man I was a member of the fire department.

Q. Did you have water works here then?

A. No, sir.

Q. Have you ever worked putting out fires with the water works as now in use?

A. No, sir; have not.

Q. You as a member of that committee signed and made this communication to Mr. H. H. Epping, president, dated May 7, 1894, set out in the proceedings of council?

A. I guess,—yes.

Q. That's the communication you made?

A. Yes, whatever I signed my name to.

Q. I will refresh your recollection: you refer there to the Rankin resolution?

A. Yes, sir.

Q. That's the resolution in which council stated or declared that they would not be bound by the contract because it was not submitted to a popular vote? You were aware when you signed this letter that the Rankin Resolution, to which you refer, was the resolution in which the city council declared that the contract was not binding because not submitted to a popular vote?

A. Good deal more of it than that.

Q. You were aware that was in the resolution?

A. If I signed my name to it; but I say there was more than that to it.

Q. Isn't it a fact what you had in mind and what you submitted to Mr. Epping, as President of the company, was not whether the works came up to the contract, but whether the company was

1182 willing to enter into a new contract: isn't that a fact?

A. I don't think that covered all the ground.

Q. Read your letter and see if there is anything else except that?

A. You will notice accompanying this letter here was the report made by Mr. Hall of Hall Brothers, Atlanta through a committee from council and citizens. It covered a great deal more ground than this.

Q. Isn't that report of Mr. Hall referred to in the new contract in there? that six million gallons per day instead of what the people were then using?

Mr. WIMBISH: The report speaks for itself and is the highest and best evidence.

WITNESS: That was part of our report. It is referred to in the early part of the letter. This little item here don't cover all the ground we acted on altogether.

Q. Isn't it a fact, that nowhere in this letter to Mr. Epping, as

President of the water company, you make any proposition that indicated that it would be satisfactory for them to correct any defects, if there were defects to make the system come up to the present contract; but what you wanted to know was, were they willing to enter into a new contract?

A. We wanted to know whether they would carry out all that is covered by that referred to here.

Q. And enter into a new contract?

A. Yes, which would have made a new system of water works.

Q. Isn't it a fact that it was brought to your attention in
1183 reply to that very letter in a letter from Mr. Epping, that if there was any violation of the contract we have no knowledge of the same—it has not been reported to us, after inviting you to call attention to any violations, if there were any, you called attention to no violations at all?

A. We had already submitted that report which we thought covered the whole ground.

Q. In that report there is no reference to any violation of the contract; but you refer to what you think would be a proper form of contract to work under?

A. It is backed up by the opinion of an engineer, Mr. Hall, who is an expert in such matters.

Q. The whole purpose of the committee was to get a new contract?

A. Yes, sir; that covered our position, the letter passed by the citizens, which practically meant a new system entirely, which they were left to do as they chose.

Q. If they did choose to do so the city would put in a system for itself?

A. Yes, sir; the proposition to protect themselves against these things.

Q. The contract you had with the water works company was not satisfactory and you wanted a new arrangement, isn't that true?

A. Yes, sir; that's it—covers the ground.

Q. You were going into the matter to try to get a new system?

A. No, sir; I was not, no further than to discharge my duties as a committeeman. Had no further interest.

1184 Q. I don't mean that you had any personal interest; but you were in fact active?

A. Active to repair or improve conditions, didn't care how it came. That's my recollection—no, we did not, if we could get good wholesome water and plenty of it.

Q. You either wanted a new contract or a system owned by the city?

A. Didn't care who owned it if we got the water for fire and domestic purposes.

Q. Your committee make any test to see whether you had the pressure the contract called for?

A. I never myself, no, sir. Just what I saw at the fires and heard other reports. Personally I did not.

Q. Did you ever call upon the company to give you a larger reservoir so as to prevent any scarcity of water during seasons of drought?

A. I think so when we submitted Mr. Hall's proposition.

Q. That proposition was for a new contract: I mean under the existing contract, did you ever call upon them to do anything more?

A. My impression was when we submitted that report we wanted a new condition of things.

Q. Don't you know it was not only a new condition of things but a new contract: that's what you had in your communications and what you had in mind?

A. Didn't mean to oust them entirely. What the people wanted was to give us a suitable system.

Q. Under a new contract?

A. Yes, if it was necessary—anything that was necessary.

Q. You deemed it necessary to have a new contract?

1185 A. It might have been necessary to do or force them to carry out the old one.

Q. Not asking you what you thought about this one: Isn't it a fact that what you insisted on was a new contract and that was all that would have been satisfactory to you?

A. No, sir; that would not have been satisfactory.

Q. The old contract would not have been satisfactory?

A. Under the old conditions of things, no.

Q. The only thing that would have been satisfactory would have been a new contract?

A. New conditions.

Q. You can answer the question I asked you?

A. No, sir; a new contract would not have been satisfactory.

Q. You wanted a new contract that would give you new conditions, is that right?

A. Yes, or if they had enforced the old one. That's the ground we occupied.

Q. Did you ever call on them to enforce the old one in any way?

A. That's my impression.

Q. Don't you know they asked you to point out any particulars in which they had failed to enforce the old one and your demand on them was for a new contract?

A. That's not my impression from the facts we furnished them.

Q. Why was it in your communications you always referred to a new contract?

A. We found out it was necessary to have a new one under the conditions. The system was not sufficient, so our experts had informed us and we took it for granted that it was true.

1186 Q. Why was it you referred to the Rankin resolution, in which it was declared that this contract was not binding because not submitted to a popular vote?

A. I don't remember what the reason was. I don't remember the wording of the Rankin resolution now.

Q. Who was on that board of health that year, do you remember?

A. No, sir; I do not.

Q. Were they members of this committee?

A. No sir.

Q. Did they advise with this committee?

A. I suppose not. I don't think it would have been necessary. I don't see why they should have done so.

Q. Have you as a citizen at any time since taken the matter up with the right committee for the purpose of action?

A. No, sir; never thought it was necessary.

Q. Did you ever take any action looking to remedying any defect or failure of compliance with the old contract?

A. That's what we did when we had that correspondence with them the first time.

Q. Have you done anything since that correspondence?

A. Since that time I have had nothing to do with it.

Q. You never called upon them to put in any filter, did you?

A. Well, we made a statement that the water was not filtered, I think.

Q. When they asked you to point out any defects, if there were any, and none were pointed out, they stated that they would be willing to submit it to the decision of persons selected by the city and themselves as to what was necessary, did you call on them—the committee, I mean to put in a filter?

1187 A. My impression is that we stated that it was not filtered at that time.

Q. Don't you know that your resolution or letters did not refer to its being unfiltered?

A. No, it does not.

Q. Don't you know that Mr. Hall's report, the expert that you got down here to give you a system that was satisfactory to the committee and to himself, did not propose to have a filter?

A. His proposition was to get water of a different character—from a different place altogether.

Q. Didn't propose to have any filter?

A. I don't know about that. I presume they did.

Q. Don't you remember that much about his report; tha- it was not stated in his report?

A. I could not say that. Could not say that it did or did not.

Q. It is a fact that the committee asked him a number of questions on the different points they wanted information?

A. Yes, sir.

Q. The question of a filter was not even then in their minds sufficiently for them to ask about it?

A. The question of wholesome water would have covered all the ground.

Q. Now then at that time the question of filtration was not in mind, was it?

A. It was, yes. It was foremost in our mind.

Objected to and question withdrawn.

Mr. WIMBISH: We will withdraw our objection and allow the question to stand.

1188 Q. If it was in your mind, why was it in your questions to Hall and in your letters to the water company, that there was no reference to a filter whatever?

A. Well, I think I can easily account for that: Foremost in our mind all the time was wholesome water and plenty of it; and it was utterly impossible to get it without a filter. I think it was in my mind and others. We went and examined the filtration plant to see if they had any means of filtering the water and found they did not.

Q. Roaring Creek is situated practically about like Holland's Creek?

A. I don't think it is. I think it has little different surroundings.

Q. Substantially the same conditions: Isn't it about the same length with the same amount of settlements around it and about the same kind of water?

A. I suppose it is pretty much the same as far as environments are concerned.

Q. In Figuring to give Columbus the magnificient system that Mr. Hall mapped out, the different elements that entered into it, you didn't include any filter?

A. It would have included it if it had been necessary, of course.

Q. You did not deem it necessary?

A. Might have been necessary and it might not. All water don't have to be filtered. Might be for domestic purposes. That would have been owing to circumstances.

Q. I am speaking of the conditions that exist on streams of the size of Holland and Roaring Creek-?

1189 A. As far as water conditions are concerned, as to the quantity of the water, it would have been constructed *fifferently*. There would have been an impounding reservoir and the water would have been different—a larger amount of water.

Q. Isn't it a fact that the water shed of the two are practically the same size?

A. Yes; but not the same size reservoir. The reservoir would have contained a good deal more water, I think. I suppose the two creeks out here would have had more water.

Q. Isn't it a fact that the larger the reservoir the bigger the amount of the exposure and stagnation on account of stretching over a larger surface with the same size stream coming into it?

A. Not necessarily.

Q. Isn't it a fact that there is a recognized proportion between the size of the stream and the size of the reservoir?

A. I would imagine that such was a fact. I don't know.

Q. You speak of the quality of the water: Mr. Hall was down here in the summer of '94?

A. Yes, sir.

Q. He was here at the time you first spoke of going out there and examining the reservoirs at the time you were on the committee?

A. That's the time, I think; but I could not remember that far back.

Q. He made his report after that time, didn't he?

A. He came down here, made his surveys, then went back and made his report afterwards.

Q. Isn't it a fact that during that season that Mr. Hall was down here he examined the condition of the water: you say you
1190 had his report in mind: the committee was perfectly aware of this in his report, in which he says, that it was always clear while I was in Columbus, and I saw nothing in its appearance or surroundings to make me doubt its fitness for a city supply"?

A. That might have been true; but when I was out there there was no water there in the reservoir and it was full of tadpoles. That was the condition when I went out there. When he made his examination in the winter time the water was all right.

Q. Isn't it a fact that the condition you speak of was when the water was so low in '95 and not '94?

A. Now the question you want me to answer: now it was the year the water committee acted when I went over there to the water works, whatever date that was.

Q. The committee acted in '94: haven't you got it confused in your mind when you went back in '95: you have got the two conditions mixed?

A. Well, I may have gone back again. I told you I was there twice; but we must have had Mr. Hall's report when I went over there.

Q. The first report was in August, 1893; and then he was down here in '94?

A. About the dates, Mr. Wimberly, I am very uncertain; but the facts I have got clear.

Q. You don't think you have confused the conditions?

A. I don't say as to dates. I have said that all the time.

Q. Isn't it a fact that you would not be positive that there
1191 was any trouble or failure of the stream in '94—as to its being '94?

A. The first time was '94 when the committee looked into it, I think.

Q. The committee had it up some little time?

A. Yes, I went over there twice and on each occasion the conditions were as I have narrated it, nearly a year, perhaps all of the year—some time I know. We had a good deal of correspondence with the water works company.

(Court here took a recess for dinner.)

Afternoon Session.

Examination of witness C. E. ESTES was resumed by Mr. MARTIN:

Q. Doctor, did I understand you to say in answer to Mr. Wimberly's question, that when this committee in '94 were having communications with the water works company and making these investigations, that the dissatisfaction on the part of the people was on account of the contract?

A. No, sir; I did not say that. I said it was on account of the service.

Q. The service rendered?

A. Yes, sir.

Q. You spoke of going over there one time and seeing what they claimed to be a filter: Did they have any structure at all?

A. Yes, sir; there was a small brick structure a few feet out from the dam, I believe 8 x 12 feet, perhaps, square, may be not so large.

Q. That or not in use?

A. No, sir; it was not in use. I spoke to the keeper about it and he showed it to me, about like boilers they have at the iron works—it was a piece of boiler iron with holes bored in it—perforated with holes to keep the trash out, the purpose of it I suppose. I put
1192 my finger in the holes.

Recross-examination.

(By Mr. WIMBERLY:)

Q. All your communications with the company were in writing, were they not?

A. Yes, sir.

J. S. GARRETT, sworn by the respondents, testified as follows:

(By Mr. MARTIN:)

Q. You are a citizen of Columbus?

A. Yes, sir.

Q. How long have you resided in the city?

A. Since '65.

Q. What position do you now hold?

A. Postmaster.

Q. State whether or not you were engaged in business here prior to your being postmaster?

A. I was engaged in the wholesale business here for 36 years.

Q. Did you ever hold the position of alderman in the city?

A, Yes, sir.

Q. How many years?

A. I think for three years—it was either three or five. I really can't tell you, it has been so long ago. I was elected alderman to fill out Mr. Joe Woolfolk's unexpired term in my absence in '87.

Q. You served in '88 and '90?

A. Yes, sir.

Q. Well, during that time state whether or not you were a member of the committee on fire and water departments?

A. Yes, sir. There was Mr. Foley and myself—I don't remember right now who the other one was that constituted the committee on fire and water works—won't say fire, but water works.

1193 Q. Did you have any communication, verbal or written with the Columbus Water Works Company, during that time, as a member of that committee?

A. I don't remember, sir, that we had any written communica-

tions. O know on one occasion that we went up to try the plug between 16th and 17th streets on 2nd Avenue, Mr. Foley and myself, and there was no pressure there; and we sent for Mr. Archer.

Q. Who was Mr. Archer?

A. Mr. Archer was in charge at that time. He was managing the water works company but I can't say whether he was president or what—anyhow, he seemed to be the man in authority at that time. We sent for him to come up there and see it; and he failed to come. Mr. Foley and I went down to his office, which was on 12th Street, and asked him why he didn't come; and he said he was very busy. We told him that we wanted to see him and wanted him to examine the pressure. He says "Now, see, gentlemen, I just have not got the time." We told him how it was and he said he would remedy it. There was no pressure and besides the water was unhealthy. There was a smell to it. Smelled like spoiled fish.

Q. State whether or not he recognized the complaint as a valid complaint?

A. He did not say much, only that he would look after it; but he didn't go. My recollection is that he sent Mott Tuggle, but I won't be positive; but I am positive of the fact of our going and making complaint to him.

1194 Q. State how often you complained to him or any other member or official of the company during the time you were a member of the committee or alderman?

A. Judge, I could not say, several times though. Complaints were frequent from every direction; but I don't remember ever to have been to Mr. Archer but one time myself. Mr. Foley was chairman of the committee; but to my certain knowledge several times.

Q. What was the character of the service rendered the city during those years?

A. You mean the water service?

Q. Yes?

A. Well, sir, it was not by any means satisfactorily so.

Q. Sir?

A. It was not satisfactory by any means.

Q. In what respect?

A. Well, there was complaint made against the supply of water and against the quality of it.

Q. Were you in a position to know whether or not these complaints with reference to the quality of the water were just complaints?

A. Well, I didn't pretend to use it myself, so far as drinking purposes were concerned.

Q. Why not?

A. Because I didn't consider it wholesome.

Q. Why wasn't it wholesome?

A. Because it wasn't filtered and there was a smell to it and my family wouldn't use it: that's all.

Q. How long did that continue from the time they built these water works?

A. I could not tell you—you might say very nearly all
1195 the while.

Q. How was it in dry seasons when the weather was unusually dry?

A. Well, at my house——

Q. Better or worse than——

A. My house is located on the corner of 2nd Avenue and 14th Street, you could not get water enough half the time in the second story to take a bath, if you wanted it. We never did bathe in it but used it in flushing the closet; and frequently we would have to carry water from down stairs to flush the closets in the rooms we occupied upstairs.

Q. When did these conditions prevail, how often and to what extent—what length of time?

A. Well, judge, along in '90, '94 and '95. My house was burned——

Q. When was your house burned?

A. In '96, my house was burned. The fire occurred in the closet of my wife's room, just a single story room; and for the want of pressure of water the house burned down—all the top burned off. The house cost me $14,000.

Q. Were you there at that fire?

A. No, sir; I was not.

Mr. WIMBERLY: We object to his stating that it was burned down from lack of water. He was not there and of course that is hearsay.

WITNESS: My sons were there.

The MASTER: I think there has been considerable evidence on the question of the Garrett fire.

Mr. WIMBERLY: Yes; sir; but his stating that the house burned down from lack of pressure I ask that that be ruled out.

1196 The MASTER: Unless the witness knows that the result of the fire was caused by the want of pressure, that portion he testifies to about the pressure would be objectionable.

Mr. WIMBISH: He may know the pressure.

The MASTER: You can examine him on that.

Q. You remember the season of '95: Did you visit the reservoirs any time then?

A. No, sir; did not.

Q. Never did visit them?

A. I visited them one summer but could not tell you what summer it was.

Q. What was the condition when you were there?

A. There was no water in the upper pond to amount to anything. Seemed to be a stream; and very little water in the lower pond.

Q. What was the character of the water you found there?

A. Just about like water you would find in a lagoon.

Q. Was it fit for drinking purposes?

A. No, sir.

Q. Did you visit it at any other time except that time when you found it in that condition?

A. No, sir.

Q. How was it in 1902—what was the character of the service in 1902?

A. Well, like it has been all the while, very poor.

Q. State whether or not it was fit for domestic use?

A. No, sir. We bought our water, the cistern gave out, for cooking and all other purposes. When the water gave out we bought it.

1197 Cross-examination.

(By Mr. WIMBERLY:)

Q. You say the water in '02 was like it was all the while?

A. It was not good, sir. It was not such as we could use.

Q. There was no difference in 1902 to what was furnished all the while—at other times?

A. I don't consider the water healthy at any time, in the summer season.

Q. You would consider it in '02 just like it was all the rest of the time?

A. Now let me see: 1902: It was either 1902 or 1903 that we had no water here I know: I won't be positive whether it was '02 or '03, that we never had any water here scarcely for any purpose. Speaking about my residence, I got here just about the time the fire was out. I was out to my plantation.

Q. What sort of service pipe have you in your house, galvanized or what you call black pipe?

A. Had galvanized. My plumbing was the most improved. I had Bruce & Morgan, of Atlanta, as architects and they supervised the whole business; and I had the finest plumber that was said to be in the city.

Q. Black pipe and galvanized?

A. No, sir.

Q. It was not black pipe?

A. No, sir.

Q. How often did your committee go to Mr. Archer?

A. I don't know how often Mr. Foley went. I had been several times; and we went twice, sir.

Q. There was twice that you yourself went along?

A. Yes, sir.

1198 Q. That's all you know of?

A. That's all I know of.

Q. You spoke of one of the time-: when was that?

A. I think it was—no, I could not tell you. I never expected to be asked about it; and it didn't make any particular impression upon my mind. I don't know whether it was '88 or '90.

Q. When was the other time?

A. The other time was prior to that; but as to dates I could not tell you.

Q. What did you go to him the other time about?

A. I went to him about the quality of the water and there being no pressure.

Q. Both?

A. Yes, sir.

Q. Was that before they built the standpipe on Broad Street?

A. Yes, sir. Now the time that we sent for him up on between 16th and 17th Streets on Second Avenue we discovered something like a fish in it, I don't know what it was, some kind of decayed fish in the water.

Q. The reason you went there——

A. We went there for the purpose of examining the pressure of the water at that plug.

Q. To see — there was an obstruction?

A. To see—said there was no pressure. I think the complaint was made by the fire chief, I won't be positive—anyhow, there was complaint made and we went there for the purpose of examining the pressure and whilst there we discovered something like that—we discovered that there was no pressure and then there was something like spoiled fish that comes out of a sewer. We didn't
1199 know what it was. It was offensive to say the least of it.

Q. That was a dead end, was it, at that time?

A. Sir?

Q. That was at that time a dead end?

A. I could not tell you whether it was dead or not.

Q. As a member of the committee you didn't investigate that?

A. No, sir; I did not. I simply went there to examine the pressure. It was right in the middle of a block. If I understand about a dead end, that is where the water ceases—when there is a cut off.

Q. No, what I understand by a dead end, is where the pipe at that place communicates with the main system at one end of it and the other end stops?

A. This plug was in about the center of the block, between, as well as I remember, 15th and 16th Streets, not far, about the center of the block.

The MASTER: You mean 15th and 16th or 16th and 17th?

A. I mean 16th and 17th.

Q. Now then, you say when you reported it to Mr. Archer, he said that it would be remedied?

A. He said he would look after it.

Q. You say he sent Mr. Mott Tuggle to see about it? Who was Mr. Tuggle?

A. Well, sir, he was a plumber here, I think.

Q. Wasn't he connected with the water works company?

A. I rather think he was, sir, I won't be positive.

Q. He was the superintendent of this kind of work?

A. I think so, sir.

Q. Did you make any test of the hydrant after Mr. Mott
1200 Tuggle went there to see whether he could remedy it or not?

A. We remained there until he come up there. There was no pressure at all. Wouldn't throw a stream as high as a man's head.

Q. Did you ever go back on any other occasion after that to see whether he had fixed it or not?

A. No, sir.
Q. You say after that the standpipe on Broad Street was put in?
A. Yes, sir.

Redirect examination.

(By Mr. WIMBISH:)

Q. You said the dead fish came out of a sewer, you meant the pipe, didn't you?
A. I mean the water pipe.
Q. Do you know whether that was a dead end he was questioning you about?
A. No, sir; I do not. I know it was about in the center of the block.
Q. You know the fish was dead when it came out?
A. Yes, sir.

1201 R. S. KING, sworn by the respondents, testified as follows:

(By Mr. MILLER:)

Q. How long have you resided in the City of Columbus?
A. Since '-7.
Q. Do you hold any official position with the city at this time?
A. Fireman.
Q. How long have you been with the fire department?
A. Since August, 1899.
Q. During your connection with the fire department, what have been your opportunities to know what the pressure of the water has been for fire purposes?
A. I have most always been pipeman, carried the pipe at a fire; and have always had poor pressure previous to this year—since they put the pumps on.
Q. Has that been more or less the case since your connection with the department?
A. Yes, sir; low pressure.
Q. You — familiar with the qualitly of the water?
A. Yes, sir.
Q. What has been the quality?
A. It has been so bad we would not drink it. We bought water.
Q. How long did that condition exist?
A. Most every summer or dry weather. In the winter time the water is a little better but it is not much.
Q. It have any odor about it?
A. Yes, sir. Got so bad we wouldn't even bathe in it at the engine house. Draw a tub full of it and you couldn't stay in the water.
Q. How often did that condition exist?
1202 A. Last summer or summer before last it was very foul.
Q. Were you familiar with the conditions that existed in 1902?
A. Yes, sir.
Q. What was the character of the water furnished here?

A. It was very poor pressure and the water was very bad. I know we didn't drink it at the engine house. Got water from wells and went to Wildwood and got it.

Q. Was the regular source of supply abandoned by the water works company anytime during that year?

A. Yes, sir; I think it was 1902. It was the time the bridge washed away.

Q. What time did they abandon the use of the reservoir water?

A. I ain't sure about the dates. It was about the time the bridge washed away. I know they put river water on them.

Q. Later in the summer you know what time they turned on the river water again?

A. No, sir; I do not.

Q. They did furnish river water here in the summer?

A. Yes, sir.

Q. How long did they furnish that river water?

A. Until they could connect another pipe on the other side and run it across the railroad bridge.

Q. I mean before the company ceased to use river water in the summer?

A. I don't know, sir; I don't remember

Q. You don't know how long they used river water?

A. No, sir; for several months. I know the city refused to pay for it on account of that.

Objected to.

1203 Mr. WIMBISH: We don't insist on that.

Q. What was the character of the river water?

A. Muddy.

Q. Was that its normal condition, muddy?

A. Yes, sir.

Q. Was it fit for domestic use?

A. No, sir; not without it was filtered.

Q. Was it filtered?

A. No, sir.

Cross-examination.

(By Mr. WIMBERLY:)

Q. Who was the chief man in charge of the engines?

A. In charge of the engines?

Q. Yes?

A. You mean now?

Q. Well, 1902, I believe was the date?

A. 1902, Mr. McKerley was engineer at No. 1 and Mr. Munn was at No. 4.

Q. Only two engines?

A. Yes, sir.

Q. Didn't have but two?

A. Two. There is one in reserve. Wasn't used and nobody was in charge of that. It was used at the Iron Works fire. Mr. Giddens run that extra engine.

Q. Mr. Giddens?
A. Yes, sir.
Q. You only had 2 regular engines?
A. Yes, sir.
Q. With engineers to run them?
A. Yes, sir.
Q. You have been pipeman how many years?
A. About four years. Pipeman and ladderman. We have no regular man for pipeman. Sometimes first one and then another; but most of the time I was pipeman.

1204 Q. Did you say they used river water before the bridge washed away?
A. I don't know, sir.
Q. You never knew of it, did you?
A. No, sir; they said they used river water but I don't know whether they did or not.

Mr. WIMBERLY: We object to that as being hearsay.

Q. The city bridge washed away here?
A. Yes, sir.
Q. How soon after the bridge washed away before the pressure was restored?
A. I don't exactly remember. As soon as they could lay a main to the railroad bridge and across and connect it up. I don't remember the time.
Q. Did you get any water protection before the new main was laid?
A. Yes, sir; they did connect with the Eagle Mills.
Q. How soon did you get fire pressure after the bridge was washed away?
A. I don't know, sir, exactly the time.
Q. Was it more than an hour?
A. Yes, sir.
Q. Wasn't it less than an hour?
A. No, sir; I think it was more than a day.
Q. That's your recollection of it?
A. Yes, sir.
Q. More than a day before they got water?
A. I ain't positive.
Q. You say it was more than a day?
A. Yes, sir; but I am not positive though.
Q. You are about as positive about that as you are about these other things?

1205 A. No, sir; I am more positive about the others than I am about that. I didn't come up here to go on the stand.
Q. How come you to come up here, to look around?
A. No, sir; to fix up these records that were throwed out—to go over them again.
Q. That's the reason you came up here this afternoon?
A. Yes, sir. I didn't know—I didn't prepare myself on the

dates of any fires or what — these different things occurred. I don remember.

Q. You say the water is bad all the time and perhaps a little bett in the winter?

A. Better in the winter than it is in the summer.

Q. You don't use it now?

A. Yes, sir; we use it now.

Q. Didn't use it last summer?

A. No, sir; not in the summer.

Q. Couldn't bathe with it last year?

A. No, sir—you could but it was very bad.

Q. Where do you do your summer bathing?

A. At home with well water.

Q. Do all of you have wells at home?

A. No, sir; sent across the street and got water.

Q. How long did that last?

A. Lasted for several months in the dry months.

Q. You said last year, you meant year before last?

A. 1902, yes.

1206 FRIDAY MORNING, *March* 4, 1904.

Court met pursuant to recess and the hearing was resumed.

L. A. SCARBROUGH, sworn by the respondents, testified as follow

(By Mr. WIMBISH:)

Q. How long have you lived in the City of Columbus?

A. I have lived here about 25 or 26 years, may be longer tha that.

Q. Are you a consumer of the water of the Columbus Wat Works Co.?

A. Yes, sir.

Q. How long have you used that water?

A. I think I have used it about as long as it has been constructe Commenced about the time——

Q. Are you familiar with the quality of the water and the servi rendered during that time?

A. Yes, sir.

Q. What have you to say as to the adequacy of the supply?

A. Well, in the Fall and Summer it has been rather short, I thin sir.

Q. Do you mean for fire protection or domestic use?

A. For fire protection. Now of late years we got to where w could not have a sufficient quantity for domestic purposes.

Q. How was the quality of the water in the summer and fa months?

A. When we had plenty of rain during the summer and fa months we had plenty of water; and it was fairly good; but whe there was anything like a dry spell, the water was poor.

Q. How frequently has that occurred?

A. Well, I don't know that I could—off and on during
1207 the whole period There would be years we would have trouble on that line and complaint.

Q. Was it prior to 1902?

A. Yes, sir.

Q. Prior to '95?

A. I don't know that. There has been complaint since '90, I think probably before that: I can't remember dates.

Q. Have you ever been over and examined the reservoirs?

A. Yes, sir.

Q. When?

A. Well, I made a visit there once when I was in council. That was in '94. I think it was about 9 or 10 years ago.

Q. Were you on the committee that made the report?

A. I think so. Not certain about that but I think I was. I know we had some trouble in council and I made a visit over there to the works; but I am not clear whether I was on any special committee or not.

Q. What time did you say that was?

A. I think that was in '93 or '94.

Q. What was the condition of the reservoirs as you found them?

A. It was bad at the time we were there. The water was low and there was a stench that came from the water on account of having run down.

Q. You mean in the lower or upper reservoir?

A. That was the upper reservoir. The lower reservoir seemed to be in a pretty good condition at that time.

Q. What was the appearance of the water?

A. There was a green scum on it. You know what kind of sediment it leaves where there is standing water with vegetable matter in it. I suppose you would call that live green scum on the
1208 pond surface. I don't remember exactly what year that was. It was when I was a member of council, I think. That's about the time. I have not refreshed my memory on it. I didn't make a visit but one time during the time I was in there.

Q. Was the water ever unfit for domestic use prior to 1902?

A. Well, I don't think the people refused to use it, that is, a majority of them used it; but there was trouble and complaint.

Q. How did you regard it at times prior to that?

A. Well, it was not as good as I would like to have had. It had an offensive odor to it occasionally; and whenever there was a rain it would be muddy. Whenever there would come a big rain it would get muddy and be unfit for use.

Q. Do I understand in times of high water or heavy rains it was muddy?

A. Yes, sir.

Q. And therefore unfit for use?

A. Yes, sir.

Q. And in low water it had an odor?

A. Yes, sir; in low water it had that offensive smell to it.

Q. Was there any other source from which the people could have gotten their water except from the water works?

A. None unless they were to buy it or had wells in their yards.

Q. Had the wells been pretty generally filled since the water works system was here?

A. Yes, sir; I think so. I filled up mine. I had a well and when I took the water works water I filled it up.

Q. How were the conditions in 1902?

A. The upper reservoir was very near, that is, when I went over there, I made a visit over there, and the upper reservoir was
1209 drained dry. Wasn't but little water in it. Turned it all into the lower reservoir and it was in a bad condition.

Q. How was the supply here in the city?

A. Didn't have any. We quit using it altogether.

Q. To what extent, if any, were conditions improved when they turned on the river water?

A. We had more water but it was muddy and nasty.

Q. Have you observed the pressure of the water for fire purposes?

A. Well, we had a fire once on 5th Avenue and I thought then we did not have as much pressure as we ought to have had; and then at the Columbus Iron Works fire. While I am no fireman and no expert on that line, and probably it might have been my over-anxiety as to the fire, I felt like we were not getting as much water as we ought to have.

Cross-examination.

(By Mr. GARRARD:)

Q. Now you speak of the fire on 5th Avenue, don't you know it is a fact that the hose burned in two very near the steamer and came very near blowing up the steamer?

A. No, sir; I do not.

Q. For lack of water?

A. No, sir.

Q. You don't know that?

A. No, sir.

Q. That is a fact, I mean by cutting it off by its burning in two, then the steamer won't be supplied for lack of water?

A. No, sir.

Q. Do you not know it to be a fact at the Columbus Iron Works fire that two steamers ceased to operate on account of some
1210 accident that happened to them, leaving but one steamer at that fire?

A. No, sir; I didn't know that. I was there and I noticed one of the steamers not playing on Broad Street. I have no official information as to that. It was said it was on account of not being able to get water. That was the talk among the crowd.

Q. That was the talk of the crowd, not anything but mere street rumor?

A. That's all. I know the steamer was not at work.

Q. Don't you know that steamer has not been at work since?

A. No, sir.

Q. It was an old steamer?

A. I don't know, sir.

Q. You speak about the water: Have you been to any other cities where they have water works?

A. Yes, sir.

Q. You have seen the water furnished in those cities: At times there was a variation in the service?

A. I suppose so. Was with ours. Of course I could not say about the other cities because I was only there for a short time. When I was there they furnished me with good water.

Q. The lower reservoir, wasn't its construction so muddy water could not run into it except in a great overflow of rain?

A. I think so, yes, sir.

Q. Wasn't the dam connecting the lower and upper reservoir-so constructed that the water overflowing the dam, just above the by-pass, so that the water flowing from the upper reservoir flowed into the by-pass without going into the lower reservoir at the
1211 time of flood water?

A. I don't know. I didn't notice that carefully and I could not say as to that.

Q. You were never out there in time of an overflow?

A. No, sir.

Q. Don't you know it to be a fact that at times when the upper reservoir was muddy that the lower reservoir was clear?

A. I don't know. I never was out there when the upper reservoir was muddy, or right after a rain. The only thing I know about the muddy water is what we had furnished us here.

Q. Is it not a fact that it was very seldom muddy water got into the mains?

A. It was not an every day occurrence; but most always after big rains the water was muddy.

Q. You mean the water was stained?

A. Yes, sir.

Q. Not unfit for use?

A. Not always so. We could not use it because it was objectionable.

Q. Wasn't the water that you speak of as being furnished here to the city, during the period you speak of, prior to 1902, wasn't it fairly good branch water?

A. It was in the winter and spring, it was very good water; but in the summer and fall whenever we had anything like a drought, it had an offensive smell to it.

Q. Did you have any drought prior to 1895: Isn't it very hard to recollect dates?

A. O, yes. I will say this: when I was in council we had trouble with it, with the water works; and there was a committee appointed from council and there was considerable wrangling here at that time; and I think on account of the pressure and the quality of the water council refused to pay the water rents.

1212 Q. That was prior to '90?

A. No, that was when I was in council, between '93 and '94, I think, when I was in council—not certain on that line.

Q. The record will show what the correct date was?

A. Yes, sir; and the record will show too the attitude of the council towards the water works company.

Q. Have they refused to pay the water rent but once prior to the time they refused to pay it in 1902?

A. I think not.

Q. When they refused to pay the water rent the first time, wasn't that before the standpipe on Broad Street was constructed?

A. I could not say in reference to that.

Q. Wasn't that standpipe constructed and some other things done by the water company and council made a report of it and it was satisfactory and they continued to pay the rent?

A. That was before I was in council. I could not say.

Q. Was it before or after?

A. I think it was before. I think the standpipe was constructed before I went in council.

Q. About that time do you recall council declining to pay for the water or the committee declined to pay for it and that there was work done which they pronounced satisfactory and they continued to pay the water rent after that?

A. I think so. I think they paid it while I was in council but there was a fight in council in reference to it. The Mayor was in favor of the water works system here and there was some
1213 trouble in reference to it; and I think council wanted to annul the contract between the water works and the city.

Q. Didn't they pass a resolution offered by Mr. Rankin which was known as the Rankin Resolution?

A. I think so, yes, sir.

Q. Were not the grounds on which they acted stated in the resolution offered by Mr. Rankin?

A. I am not certain about that; but I think it was though. I know the sentiment of council or a portion of them, was that the water works company was not complying with their contract. One special feature was that they had not filtered the water; that the water was not filtered and was unwholesome.

Mr. GARRARD: We object to the sentiment part.

Q. What was expressed in that resolution?

A. I could not say.

Mr. MARTIN: The resolution speaks for itself.

Mr. WIMBERLY: We ask to rule out what the sentiment was.

Mr. MARTIN: We object to that. They brought it out themselves.

Objection overruled.

Q. All the action that council took is on the minutes?

A. I think so.

The MASTER: That's what he means by the sentiment?

WITNESS: Yes, sir.

1214 E. P. DISMUKES, sworn by the respondents, testified as follows:

(By Mr. WIMBISH:)

Q. How long have you lived in Columbus?
A. 12 years.
Q. Are you mem*m*ber of the city council?
A. Yes, sir.
Q. How long have you been a member?
A. Seven years.
Q. What is your occupation?
A. I have been engaged in the manufacturing business up until last Fall. In no particular business now.
Q. What official position, if any, have you in council with reference to committees?
A. I have been chairman of the finance committee for six years.
Q. Did you ever visit the reservoirs of the Columbus Water Works Company in your capacity as member of the city council or in any other capacity?
A. I did upon one occasion.
Q. When was that?
A. I can't say positively what year it was, probably '98 or '99.
Q. What was the condition as you found it then?
A. There was no water in the upper reservoir. There was a vast expanse of mud in it and trash. There was a very small stream of water, probably 12 or 15 inches wide and an inch deep flowing through the bottom of it and the gates that connect the two reservoirs were open and the water was running into the lower reservoir direct.

1215 The gates were open and the water that was running in was muddy and the water in the lower reservoir was clear about some 12 feet below the entrance; and the muddy water would show as it run into the lower reservoir.

Q. Was that the result of rains or what was the cause of that?
A. It was the result of the water running through the bottom of the reservoir which was coated over with mud.
Q. What I want to get at is, was the mud taken up from the bottom of the reservoir or from rains above?
A. From the bottom of the reservoir. Had been no rains for some little time.
Q. What was the condition of the reservoir that was not covered with water as to filth, etc.?
A. It was covered over with black mud; and there were evidences of stock having walked about in it—cow tracks.
Q. Was that water then being served to the city as its supply?
A. Yes, sir.
Q. Did the city have any other supply?
A. Not that I know of.
Q. Did you detect any odor to the water?
A. I could detect that in the water at the house that I was receiving from the reservoir.
Q. How come you to detect it at the house?

A. From bathing in it and washing your face and hands in the morning, coming directly in contact with the nostrils.

Q. Was it fit at that time for domestic use?

A. No, not fit for drinking, according to my view.

Q. Did you consider it fit for bathing?

1216 A. Well, I used it for bathing because I didn't have any other. Cleanliness required it. I had no other place to get water from except for drinking purposes. I had a cistern up there at the factory from which I could get drinking water.

Q. What were the conditions in 1902 with reference to the quantity and quality of the water?

A. In 1902, after the failure—after the breaking of the pipe on the bridge, we had nothing but muddy river water for sometime; and after the connection was made we had clear water for awhile and then it got to be very objectionable indeed. In fact, it got to be offensive.

Q. Well, I am speaking of the summer of 1902: was that water continued to be used by the city after some time in 1902, in July, or was river water substituted?

A. I don't remember the time. Made no impression on me and I didn't charge my memory with it, at least as to the time; but during 1902, as I understood, river water was turned on into the mains. The water we had been using for sometime was offensive and river water was turned in. I don't remember the exact date.

Q. How were the conditions improved, if any, by that water?

A. I preferred the river water to the other water on account of the fact that it was not offensive; but it was very objectionable to use on account of the mud that was in it.

Q. Were those the conditions when council adopted the ordinance providing for the issuance of bonds for the erection of a municipal water system?

1217 A. I don't recollect the date that the bond ordinance was passed.

Q. September, wasn't it?

A. Yes, sir; those were the conditions in September.

Q. Mr. Dismukes, I will ask you if the city council, since you have been a member, has treated the contract with the Water Works Company as having been abrogated and repudiated by the declaration of the Rankin ordinance in '94?

Objected to and question withdrawn.

Q. I will ask you whether appropriations were regularly made at the suggestion of the finance committee for the payment to the water works company for services rendered the city from the time you became a member of the committee until 1902?

A. Apportionments every year has included an estimate to cover what was the contract price of the water company with the city.

Q. The contract price?

A. Yes, sir.

Q. What contract?

A. The contract that the water works company had with the city.

Q. Mr. Dismukes, is there any other source of supply of water to this city except through the Columbus Water Works Co.?

A. Well——

Q. To the city in its corporate capacity and to its customers?

A. None that I know of.

Q. Are you familiar with the contract between the city and the water works company?

A. I have read it once or twice; but I don't know that I can say that I am very familiar with it.

1218 Q. I will state that the contract provides, among other things, that the purity of the water may be tested by experts, one to be selected by the water company, one by the city and if they can't agree, then a third; and that in the event the water is found to be impure after a test of that kind, that the city may discontinue the use of the water: I will ask you what would have been the result to the city and its inhabitants, had they discontinued the use of the water under those circumstances, if they had discontinued it for domestic purposes and not for fire purposes?

Objected to on the ground that the question elicits an opinion from the witness. Objection overruled.

Q. What would have been the result if the water had been cut off?

A. The result would have been that house holders would have been compelled to get water from some other source.

Q. For what purpose?

A. I would have been compelled to get water from some other source for any purpose.

Q. What other sources were open?

A. I can only say that there were some wells in the town and there were some cisterns in the town; but how many I am unable to say.

Q. Is there a system of sewerage in this city?

A. There is a system of sewerage.

Q. How could the citizens have gotten water to flush their closets and uses of that kind?

A. In my house I could not have gotten it in any way at all.

1219 *The* WIMBERLY: Your Honor understands we object to all this?

The MASTER: Yes, but that is a mere statement of fact.

WITNESS: If the water was cut off the citizens would have been without water.

Cross-examination.

(By Mr. WIMBERLY:)

Q. You have been a member of council how long?

A. Seven years.

Q. The last question asked you by Mr. Wimbish, I believe, was whether they had a system of sewers here: Will you state as a

member of the finance committee how much the city paid for flushing the sewers per hour?

A. I have never examined into that question. I am not familiar with it.

Q. You don't know?

A. I don't know.

(By consent of counsel it was agreed that the price the city paid per hour for flushing sewers was 40 cents per hour; and that this evidence should be inserted in the testimony as delivered by this witness E. P. Dismukes.)

Q. What formal action did the city ever take in the matter of giving formal notice to the water company of any defect in the system?

Objected to as being a matter of record.

Objection overruled.

A. I don't remember that any action was ever taken when I was present. I will state that for two months in every year for
1220 the last six years, I have been absent and have not attended any of the meetings of council, for the months of August and September.

Q. You were here during the other months in the year?

A. From about the 15th of October every year.

Q. You say that no action was ever taken that you know of?

A. Not that I know of.

Q. No experts were ever selected?

A. Not that I am aware of.

Q. No requests for experts were ever made by council?

A. Not when I was present.

Q. Now do you remember what year it was that you visited the reservoir out here?

A. I don't know positively, sir.

Q. You remember the time of the year?

A. It was in the latter part of October.

Q. How come you to visit it at that particular time?

A. I was requested, my recollection is, by the Mayor to go with him and other members of council to inspect the reservoirs.

Q. You were a member of council at that time?

A. Yes sir.

Q. That was at a time when the water was low?

A. Yes sir.

Q. It was the only time since you have been in council the last seven years that you were ever called upon or you deemed it necessary to make such an inspection?

A. It was the only time I was ever called upon to go.

1221 Q. Did you ever make such an examination at any other time, without such a call, on your own motion?

A. I visited it once in the Spring time.

Q. What spring time was that?

A. I don't remember right now.

Q. Prior or after that?

A. Prior to that.
Q. Did you visit it for a purpose or just happened to be passing by?
A. Riding for pleasure I rode out there.
Q. You don't remember whether it was before or after?
A. Before.
Q. It was before?
A. Yes, sir.
Q. How long before?
A. I could not tell.
Q. Was it during the time of a drought?
A. No, sir; that was in the Spring time.
Q. At that time it was full of water?
A. The lower reservoid was quite full of water, yes.
Q. There was water in the upper reservoir?
A. Some.
Q. Those were the only two times you ever saw it?
A. The only two times I ever visited out there.
Q. After you made your visit to the reservoirs in '98 or '99, what action did you take?

Objected to on the ground that the record will show what action was taken, if any.

Mr. WIMBERLY: We don't insist upon what this witness did only in an official capacity.

The MASTER: Doesn't the record show that?

Q. You had no proceedings but what appear in your records?
A. No, sir; that I know of. I was not present at any
1222 meeting that I remember of——
Q. If there were any proceedings——
A. Not being a member of the water committee I can't positively say that there was no proceedings taken by council.

The MASTER: The records show what was done by council.

Q. You had no examination made of the water at any time, analysis, anything of that sort?
A. I did not.
Q. You say you have water in your house?
A. Yes, sir.
Q. You use it for bathing now, don't you?
A. Yes, sir.
Q. There never was any failure of the water prior to '02, was there, until the bridge broke?
A. Not when I was in the city. I can't speak for the two months I was absent. Never any failure of water to run through my pipes except in 1902, when I was at home.
Q. I believe you spoke of detecting some odor in the water in your house: that was at the time of your visit?
A. That was at that time and I detected it at several other times within the last 7 years, the water has been offensive to bathe in.
Q. The few times you had extraordinary droughts, a short time, you considered the water offensive?

A. Generally during periods of drought in the Fall.

Q. Those were periods of extreme drought that did not come every year?

A. No, I can't say that it was every year. I just say this:

1223 I didn't charge my memory with the times it has occurred.

J. L. NEWMAN, sworn by the defense, testified as follows:

(By Mr. MILLER:)

Q. Do you reside in Columbus?

A. Yes, sir.

Q. How long have you been living in Columbus?

A. I have been here about 21 years with the exception of about six years.

Q. What six years were you not a resident here?

A. From '92 to '98, somewhere along there.

Q. Do you hold any official position with the city?

A. Alderman.

Q. How long have you been an alderman?

A. Three years—this is my third year.

Q. Mr. Newman, are you familiar with the quantity and quality of the water that has been furnished by the Columbus Water Work Company for the last 20 years with the exception of the years you have stated that you were not a resident of the city?

A. I have been using the water ever since I have been here. A times it was plentiful and sometimes poor and scarce.

Q. Have you been familiar with the pressure in the city?

A. No, sir; I don't know much about the registered pressure, only when I would be at fires and see the water used.

1224 Q. What has been your observation from having seen i used at the fires you attended?

A. My observation has been that there was not pressure enough

Q. How did you arrive at that conclusion?

A. By seeing the water when they could not throw it on th buildings that were burning.

Q. What has been the quality of the water that they have fu nished?

A. Well, during the winter season it has been moderately goo considered so; but during the summer and fall it has been poor times.

Q. Been poor?

A. Yes, sir. Sometimes worse than others in the fall.

Q. Do you remember the particular years at which it was wor than others?

A. Well, I could not recall exactly the times. I have seen several times in the fall of the year when it would be very bad; b never so bad as it was in 1902.

Q. Do you remember how it was in '98, the year you came bac from Opelika?

A. I came back here in the fall. I was here during the year b I could not say exactly how it was.

Q. How was it in the fall of 1898?
A. I could not say. I think it was fairly good in the winter. When I first came back here it was not so good.
Q. Did you visit the reservoirs at that time?
A. I was there during the spring of '99.
Q. What was their condition at that time?
A. Well, at that time there was plenty of water. It was in the winter season and the lower reservoir was full.
1225 Q. Did you visit them any time subsequently to that?
A. Yes, sir; I visited there very often through the summer season. We would go out there during the time I was here—before I left here.
Q. You mean that was prior to '92?
A. Yes, sir.
Q. Did you ever see the water prior to '92 in the reservoirs out there?
A. Yes, sir.
Q. Did you ever see it at a low stage?
A. Yes, sir.
Q. How low was it?
A. I have seen it, before they put up the upper dam, I visited there very often, I have seen it when it would be half full, probably two thirds, sometimes even lower than that.
Q. What was the quality of it?
A. Can't say exactly. At times in the summer it was not very good.
Q. At that time did you observe any offensive odor in the water, prior to '92, before you left here?
A. I could not say. At sometimes, though, probably might have been earlier than that, it was offensive. Couldn't *not* say exactly as to the date.
Q. What was its character as to clearness or muddiness?
A. Well, at times it was clear and at times it was muddy. Muddy after rains, such as that.
Q. Do you know when the by-pass out there was built?
A. No. They were working on it. Could not say exactly the date. I was there during the time they were working on the by-pass.
Q. Is it not a fact that most every year, in this section, we
1226 have a drought in the latter part of the summer or early fall?
A. Yes, sir; very nearly every year. Some years it rains more than others.
Q. What's the character of the water during those seasons of the year, as a rule?
A. Bad—not fit to drink, I should not think.
Q. Are you familiar with the construction of the upper reservoir?
A. Nothing only seeing it there. I have visited it often.
Q. Did you ever observe it closely?
A. Yes, sir.
Q. Did you make a visit to the reservoir in 1902?
A. Yes, sir.

Q. Do you remember the time you visited it?
A. It seems to me it was in July. I could not say the exact time.
Q. How were the conditions there at that time?
A. Well, I will state how come the visit to be made. I was a member of council and on the water works committee. There was a good deal of complaint about the water. I got in a hack, myself and Mr. Jones, and went out to the reservoir to see the conditions—to see what the conditions were—what the trouble was. There were a good many reports about town and we went out to see it. When we got out there the lower reservoir, I suppose, was two thirds or half way full, not over half full; and the upper reservoir was might- near dry, except a little pool just above the dam. We walked all around there.
Q. Was there any water running into the reservoir at that time?
1227 A. Very little. We went clear around it and found one little stream, I suppose, running in from the east branch, running into the reservoir—a very small stream.
Q. Did you see any dead fish there?
A. We didn't examine very closely. We could see the water fluttering around there; but we didn't examine about the dead fish. Above the pond was entirely dried up.
Q. That the only visit you made there in 1902?
A. Only one until later on in the year.
Q. When did you next visit there?
A. I think it was somewhere about December.
Q. At the time you first visited there in 1902, was the city at that time being supplied with the water from the reservoirs?
A. Yes, sir; I think so.
Q. Being supplied here for drinking and domestic use?
A. Yes, sir.
Q. Was it or not at that time offensive?
A. Yes, sir; I think it was in July, sir.
Q. Was the water that was coming into the upper reservoir did it remain in the reservoir or did it run out?
A. There was a gate open from the upper reservoir to the lower reservoir and there was some water running in there then.
Q. What was the character of that water that was running in from the upper to the lower reservoir?
A. It was kind of muddy.
Q. Was it foul?
A. Yes, sir.
Q. Was it fit for domestic use?
A. I should not think so.
1228 Q. Was its used continued any time in 1902?
A. I think it was.
Q. Do you remember at what time?
A. No, sir; I could not tell the exact date.
Q. What was the city supplied with after that?
A. River water.

Q. How was that water?
A. It was muddy.
Q. That filtered?
A. No, sir; don't think it was.
Q. What was the condition of that water?
A. It was muddy.
Q. Was it fit for domestic use?
A. Would not consider it so. We did not use it at my place.

Cross-examination.

(By Mr. WIMBERLY:)

Q. You say you have been living here about 21 years with the exception of about six?
A. Yes, sir.
Q. Up until 1902, with the exception of a few short times, the quality of the water has been pretty good,—pretty good quality of branch water, wasn't it?
A. It done fairly well through the winter and spring until dry season come on. There was no general complaint much until dry weather.
Q. That is, when it was unusually dry here, ordinary seasons it went through all right, didn't it?
A. Yes, sir.
Q. Wasn't that way ever- summer, was it?
A. Some years it wasn't so bad as others. Every summer though unless it was extremely wet, the water got pretty low—pretty scarce in the summer season.
1229 Q. You say you have been out to the reservoirs a good many times?
A. Yes, sir.
Q. The only time you have noticed them dry was in 1902?
A. I have seen the upper reservoir very nearly dry on previous occasions before this.
Q. Do you remember what year that was?
A. No, sir; I could not say what year.
Q. Always a fresh stream running through it except in 1902?
A. I have seen it running through there on different occasions, but I could not say.
Q. I am speaking now prior to 1902?
A. Couldn't say it was always running through there.
Q. I mean when you saw it?
A. Yes, sir.
Q. You never saw it when it was not running through it?
A. Yes, sir; I have seen it when it was not running through there, that is, the gate was shut down. Might have been running some other way.
Q. The water was coming into the upper reservoir?
A. You mean the stream?
Q. Yes?
A. I never examined the stream so carefully as the last time when

I was there. I have been around there several times and crossed the bridge and seen water running in there.

Q. You never saw the stream give out entirely until 1902?

A. Not completely until then.

Q. You spoke of the time before the upper reservoir was built; Can you fix it approximately when the upper reservoir was built?

A. No, sir; I could not. I don't remember the date.

Q. When it was built the- it give clearer and better water, didn't it, than before?

1230 A. I think it done some good, of course.

Q. Did you make a habit of attending fires?

A. No, sir; only on special occasions. I sometimes go to fires.

Q. You never specially noticed it at fires; but would leave that to the fire department?

A. Not so much before as I have since I have been a member of the fire committee.

Q. The last three years?

A. The last two years I have been a member of the fire committee.

Q. Just the last two years?

A. Yes, sir.

1231 R. W. SLADE, sworn by the respondents, testified as follows:

(By Mr. MARTIN:)

Q. Are you a resident of Columbus?

A. Yes, sir.

Q. How long have you been a resident?

A. I have been here since '82.

Q. Do you know about what time the Columbus Water Works was built?

A. No, sir; I have not got the dates down. I don't remember it very well. Couldn't give the date, I don't think.

Q. State whether or not you have been a consumer of the water furnished by the Columbus Water Works Co.?

A. I have since '90 when I married. Before that I was not.

Q. You didn't drink the water before?

A. Had very little of my attention called to it. I roomed down at my office and had a most excellent well there.

Q. What has been the character of the water furnished by the Columbus Water Works Company since you became a water taker?

A. During the winter season, wet season or Spring, it was fair water. In the summer when it would get low, it would sometimes get offensive. Turn it in the bath-tub and you would hardly feel inclined to take a bath. That was during the dry seasons—summer. Never used it without filtering it on those occasions. I would get water from our well at the warehouse when it would get offensive, during the dry seasons and summer. After the fall rains came it was fair water, muddy after big rains, though.

1232 Q. You say you filtered the water?

A. Always filtered it. Never have used it without it.

Q. Why did you filter it?

A. Because it was very frequently cloudy, you know, not clear and sometimes, as I say, a little offensive. Didn't think it was pure enough to drink in its natural state.

Q. Do you remember how it was in the fall of '95: you remember anything about dates?

A. No, sir; I could not locate the date; but along about that time one season it was very bad, worse than it had been previously. I hauled the water we used for domestic purposes from the warehouse. It was a very dry season, the river was very low and all the branches were low.

Q. How about '98, do you remember about that?

A. I could not state positively. I know a year or so previous to the washing away of the bridge, when the main was broken, it was a little worse than usual. One season previous to this unusual drought.

Q. How about 1902, that was the year?

A. That's the year the bridge washed away?

Q. Yes?

A. Very bad for a long while. We had to haul all of our water and only used the water works water to flush closets. It was right offensive too. We had muddy water all the summer, supposed to be from the river.

Q. Was the river water suitable for domestic purposes?

A. It was not. I could not filter it. My filter would not work with it. No filter I could get would.

1233 Q. Wouldn't filter it?

A. No, too thick.

Q. What did you do for water during that time?

A. We bought a good deal of it from people outside who served it and hauled it from our well at the warehouse. A great deal was hauled from there to furnish ourselves and then a good many of our friends.

Q. From the warehouse well?

A. Yes, sir.

Cross-examination.

(By Mr. WIMBERLY:)

Q. You say you never paid much attention to it prior to '90?

A. I know occasionally it would be out of shape; but my personal attention was never called closely to it, no.

Q. What sort of a filter did you have?

A. I bought various ones.

Q. Tried more than one?

A. Yes, sir; half a dozen. The filter they used by pressure would choke up at once with river water and the other required cleaning every hour or two. The sediment would stop up the holes.

Q. The small filtered needed constant attention?

A. Not with clear water.

Q. I mean with muddy water?

A. Yes, sir.
Q. Which would make it very troublesome?
A. Yes, sir.

1234 J. R. BRANNON, sworn by the respondents testified as follows:

(By Mr. MARTIN:)

Q. Are you a citizen of Columbus?
A. I am.
Q. How long have you been living here?
A. About 30 years, between 30 and 35.
Q. State whether or not you have been a consumer of the water furnished by the Columbus Water Works Company since its establishment?
A. Ever since.
Q. Have you held any official position in the city during that time?
A. I was councilman.
Q. How many years?
A. Two years.
Q. What has been the character of the water furnished the citizens and city during that time?
A. Bad.
Q. Well, in what respect?
A. For drinking and for domestic purposes both.
Q. For what length of time has that prevailed, all the time?
A. Well, sometimes better than others.. In the winter time after a freeze I drink it right along without any trouble.
Q. How about the summer and Fall?
A. Well, I bought it most of the time whenever I could get it elsewhere. Bought the majority of the water I have used for the last two years especially.
Q. Do you remember how it was in '95?
A. Bad as it could be.
Q. Did you visit the reservoirs that year?
A. Yes, sir.
Q. What condition did you find them in at that time?

1235 A. Well, I found them, all the water was out of the upper pond, full of mud and slime, what little there was that stood in there was all muddy; and a little stream running—well, the stream had even stopped running into it. The lower reservoir was very low and had a bad odor: small quantity.

Q. Do you remember what time of the year that was?
A. I think it was along in November and December, along there, October, November or December.
Q. You say it was October, November and December?
A. Somewhere along there, I can't recollect exactly. I think it was bad all along through the latter part of the summer. There was a great hue and cry about that time; but I don't re-call exactly the length of time.

Q. State whether during hot weather, summer weather and dry weather, the water during the last 20 years, in your judgment, was fit for use?

A. I never did like it. More or less complaint.

Q. What about 1902?

A. That was almost the same conditions as prevailed in '94 and '95.

Q. As in 1902?

A. Yes, sir—well, I didn't see it in 1902; but it could not have been any worse in 1902 than it was before. Don't see how it could very well.

Q. Was there any dead fish out there in '95?

A. Yes, sir.

Cross-examination.

(By Mr. WIMBERLY:)

Q. What years were you a member of council?

A. I think it was '94 and '95 or '95 and '96.

Q. You were a member at the time of the Rankin
1236 resolution?

A. I don't re-call it.

Q. You don't remember the fact as a member of the committee that you made a report to council?

A. Sir?

Q. In which you wound up by saying, that inasmuch as a majority of the council were placed there by a bond constituency, that they should leave nothing undone to forward that end?

A. I remember that.

Q. What did you mean by a bond constituency?

A. I meant that there was a council put in there for the furtherance of this bond question for water.

Q. Bonds for the city to build its own water works?

A. Yes, sir.

Q. In other words: really what you were advising them to do, was not to correct the evils in the present system, but to remember that they were put there by a bond constituency to build a system that the city might own?

A. And the people wanted better wa*nted*, so did those that were on the council and so did I.

Q. And you wanted the city to own it?

A. Didn't care who owned it.

Q. Why did you speak about bonds?

A. That's the only way we could get it, as I understood it.

Q. You didn't try any other way?

A. Didn't know whether we could do any other way.

Q. You didn't try?

A. Not as I know of.

Q. You say in '95 there were dead fish out there?

A. Yes, sir.

1237 Q. When it was fresher in your mind you reported to council how bad things were, did you speak of them as being dead fish?

A. They came to the top, you know. I saw several around on the edges dead. A portion of them just come to the top to get a little fresh air—and little better water.

Q. When you made your report to council you spoke of them as being half dead. These things get a little worse the further you go: You remember when it was fresher in your recollection that they were half dead?

A. They had that appearance. You could go and pick them up. You could go and catch them. Live fish you can't do that very well.

Q. When you call them dead fish now, those were the same fish you called at that time half dead?

A. No, some were laying on their stomaches.

Q. You didn't say anything about that in your report?

A. No, I didn't want to make it any worse than it was.

1238 T. E. GOLDEN, sworn by the respondents, testified as follows:

(By Mr. MARTIN:)

Q. What is your occupation?

A. Manufacturer.

Q. What kind of manufacturer?

A. Iron manufacturer.

Q. Are you a citizen of Columbus?

A. Yes, sir.

Q. How long have you been a citizen?

A. A little over three years.

Q. State whether or not you did business in Columbus before you were a citizen?

A. Yes, sir; I have been in business here all of my life—in business since I lived on the hills of Alabama. I was born in Columbus and lived here 5 years and moved to Alabama and came back three years ago and been in business here ever since. I was identified with the Columbus Iron Works Company and the Golden Foundry & Machine Co.

Q. What have been your opportunities for observing the character of the water furnished by the Columbus Water Works Company?

A. I should say generally good.

Q. What is the character of water they have furnished?

A. In the past?

Q. Yes?

A. I should pronounce it very bad at times, and sometimes fairly good. But majority of cases I would say it was bad.

Q. Do you remember how it was in '95?

A. No, sir; I can't re-call that.

Q. You don't remember dates?

A. No, sir.

Q. Well, when you say it was bad, in what respect was it bad?

A. Well, I have noticed it being muddy a great many
1239 times; and I have known foul odors to arise from it; and then two years ago I should call that bad.

Q. Mr. Golden, how was it in 1902?

A. I didn't go to the ponds in 1902. I know it was very bad along about that time. We could not use it at our home, very foul odor arose from it—it was very bad indeed. I understand it was cut off and river water was turned on.

Q. How did that improve matters?

A. Well, it greatly improved the odor and possibly the purity of the water; but there was great deal muddier water from the river. A great deal muddier than the other water.

Q. Was it fit for domestic use?

A. For flushing closets it was all right; but if you wanted to take a bath in it, one could imagine they were going back to their boyhood days when they bathed in the Chattahoochee River.

Q. Have you any knowledge of cast iron pipes?

A. Pretty fair knowledge. Only want to say I can go into and test the qualities of it, things of that kind.

Q. State whether or not cast iron pipe are uniform?

A. It is not always the case in thickness.

Q. In thickness?

A. No, sir.

Q. Explain that?

A. They are made with a core running through it and that core can shift a little to one side or the other and sometimes to the extent where it makes the pipe faulty, will not do to ship out.
1240 Sometimes under a test it will prove to be faulty and not be shipped out. If the pipe should stand the test, then probably it will be shipped out; and then the core might not be in the center, you know.

Q. Do you know anything about the life of cast iron pipe in the ground?

A. Only in this way: that there are some that will last longer than others under certain conditions. Some pipe will last longer than others.

Q. The same pipe, made at the same factory?

A. At the same time. This applies to wrought iron as well as cast iron pipe.

Q. From examining that sample, could you tell from that whether or not that pipe was uniform in thickness, along on the sides?

A. No, sir; that would not be called a fair sample of pipe. To get a fair sample a ring should have been cut off of one section of it. This is only on one side. The core could have shifted to the opposite side. Where this was cut it was only a piece about ¼ inch thick or ⅛th inch thick, which don't indicate the figures on the other side of the pipe.

(Referring to sample of pipe identified by witness W. S. Greene as having been cut from six inch main near Racine Hotel, Nov. 19, 1903.)

Cross-examination.

(By Mr. WIMBERLY:)

Q. You mean fair sample: you mean by looking at this you could not tell whether the rest of it was the same width or not?

A. No, sir; same thickness.

1241 Q. As a matter of fact if you were to get it from all around you could not tell from that it would be the same thickness at the other end?

A. No.

Q. If you were to take it from part of that pipe, you could not tell that the next pipe was the same thickness, could you?

A. No, sir.

Q. If you had a thousand pipe and tested 999, you could not tell what the thousandth was?

A. No, sir; you could not tell about what you had examined.

Q. You would have to thoroughly examine the other part or the other pipe?

A. Exactly.

Q. Isn't there some system of testing pipe by which it can be known whether they are all at least of such thickness as to have the proper tensil strength?

A. Yes, as regarding the strength.

Q. It takes a certain amount of thickness to give strength, doesn't it?

A. If you limit it to the breaking strain, then it will take a certain thickness; but where you don't limit it to the breaking strain, for safety—the factor of safety then of different cast iron pipe could be of various thickness and still stand the test?

Q. If pipe were shipped from the factory which were tested so as to stand the hydraulic test before they are used—stand a test of 300 pounds to the square inch, the test being throughout the whole pipe, every part of it, that would necessarily exclude the possibility of their being such a thin place in it as to weaken it, wouldn't it?

A. No, I can't say that it would.

1242 Q. It would not?

A. No, sir.

Q. You don't think so after standing the 300 pound test?

A. Yes, sir; and possibly if it was tested again to 300 pounds it would break.

Q. You don't believe in tests?

A. I feel if you carry it too far you can weaken pipe instead of doing it good.

Q. Suppose you don't carry it too far?

A. I can't tell.

Q. Suppose you carry it to a point where that pipe will be expected to stand and not beyond what the pipe ought to stand, a test of that sort would show whether it was good pipe?

A. I would like to make this statement: that the testing of pipe, as a rule, is done after it is tested at the factory; and there is no way of telling whether it will stand that same test or not, unless you test it again and you keep on testing it.

Q. Your idea is, that the only thing that would be worth anything as to a test, would be to test every pipe and every part of the pipe, simply not one side, but all the sides and the ends and when you got that system of testing, it would not count for anything unless you tested it again?

A. You have got to trust to luck in regard to that.

Q. That looks all right, does it not?

A. The cast iron in that seems to be good, yes.

Q. Does that seem to be corroded enough to weaken it appreciably?

A. I should say not; but I don't know whether that was a piece of cast iron pipe or not.

1243 Q. The only way that you could get at this thing is by average, when you made connections at different parts of the city when you put in water at one man's house or put in a connection for something else, you could by a general average get a pretty good idea of the condition of the system, couldn't you?

A. O, yes.

Q. Not confined to one sample?

A. Certainly not.

Q. A man who is in the business of making these connections could tell whether the pipe was in a good condition or not, as a whole, couldn't he?

A. As a rule he can.

Q. Mr. Golden, haven't you made castings down at the Columbus Iron Works, joints and things of that sort?

A. I have not made them myself but I know they have made them at the Columbus Iron Works; and we have made them at the Golden's Foundry & Machine Company.

Q. What strength do those joints have?

A. I don't know, sir.

Q. You are not familiar enough with them to know?

A. I can't tell that.

Q. Is it not a fact that cast iron is of great durability as material?

A. Well, yes, it may be considered so.

Q. Cast iron is regarded by people who have studied the thing that cast iron is of such great durability that they cannot even fix the number of years that it will last?

A. You can't prove that by me.

Q. They have never been able to estimate how long cast iron will last?

A. You can't prove that by me, I am sure.

1244 Q. Isn't it not a fact that water works systems are using pipe 40 or 50 years old and the pipe is practically the same as it was when it was put down?

A. I would not believe that.

Q. You have not examined to see?

A. No.

Q. What position do you now hold with the city?

A. I am chairman of the Water Board.

Q. You have held that office how long?

A. About little over a year, I think.

Q. Were you chairman of the water board in 1902 when they had this election?

A. No.

Q. You were not? Just afterwards?

A. I don't know, I suppose six or eight or 10 months afterwards.

Q. You were not a member of council until after——

A. Have never been a member of council at all.

Q. Not a member of the water board at any time prior to 1902?

A. It was the commencement of the water board—water commissioners.

Q. Created under this new law?

A. Yes.

Q. You spoke of having lived in Alabama a good long time, where was it in Alabama you lived?

A. Out on the hills, about a mile from the bridge.

Q. Did you use the water works at your home?

A. No, well water there.

Q. On that side of the river?

A. Yes, sir. Over there.

Q. So as a matter of fact you never had an occasion to see very much as to the quality of this water here until you looked into it in 1902?

1245 A. Why, yes, I guess I did. I have seen a great deal of the water in the town at different places, different stores, different manufacturing plants, have seen the hydrants opened in the streets cleaning them out; and have seen the mud coming out of them. I have seen right sharp bit of it, Mr. Wimberly.

Q. What time did you say you came back to the city?

A. October 1, 1900, I think—last October was three years ago.

Q. Have you used the water in your family since you came back?

A. Up until it got so bad—until 1902 I cut it off then; and I had distilled water brought from the ice house until about three months ago. I used the water works water for bathing purposes and for flushing closets.

Q. Do you use it now?

A. No, I am using water works water now for drinking purposes.

Q. Do you know as chairman of the board, do you remember what the capacity of the Blue Springs is?

A. I would not like to go into that question, if I can help it; because there have been several estimates made on that; and I don't know myself now where I am at on it.

Q. Several estimates as to quantity?

A. Yes, sir.

Q. Can you give me the range of those estimates?

A. About 750,000 gallons a day to double that amount.

Q. So really the maximum you could count on if your city
1246 grew, taking the highest estimate, would be a million and a half?

A. Yes, from the Blue Springs itself.

Q. Isn't it a fact that some estimates have been as low as 500,000?

A. I can't recall that.

Q. How far is Blue Springs from here?

A. About 19 or 20 miles, so I am told.

Q. I suppose from your knowledge of carrying water in iron pipes, you know it to be a fact that the further it has to be carried the bigger the pipe you have to carry it through to allow for what they call friction loss?

A. I understand something of that.

Q. Twenty miles I believe you said?

A. I think so, yes.

Q. There are very few cities of smaller size than New York or Baltimore that carry their water any such distance as that?

A. I don't know about that.

Q. Any estimates made by the city's engineers as to what it would cost to get that Blue Springs water here?

A. Yes, I think there was.

Q. How much did it amount to, exclusive of distributing it after you got it here?

A. Those figures are off my mind at present. We had a report, my recollection is of five hundred and some odd thousand dollars.

Q. What sort of pipe was that, cast iron or wrought iron?

A. Cast iron.

Q. Cast iron pipe is very much more durable than wrought iron pipe, does not rust out as quick?

A. That is my impression and understanding of it.

1247 Q. Do you know anything about riveted pipe: you ever look into that?

A. Only by reading about it.

Q. As a matter of fact cast iron is regarded as the most durable form of pipe to use?

A. Yes, sir.

Q. As chairman of the water board, you are really, you might say, at the head of this movement for municipal supply—you are the official at the head of that, ain't you?

A. I can't say that I am at all. I am only one of several though.

Q. You just represent others?

A. I was elected a member of the water board by the council. I don't think that I can say I am, in answer to your question.

(By the MASTER:)

Q. Since you have been chairman of the water board, have you given the question of water supply for the City of Columbus investigation?

A. As much as I possibly could, yes.

Q. Are you prepared to give an opinion as to the best or what you consider the best source of supply of water for the city?

A. I would prefer not to do that, if you will allow me, if you will pardon me. There are a board — commissioners and I don't know whether we are going to agree on the source of supply or not; and I might obligate myself a little too far.

Q. I mere- asked you:

A. I would prefer not to give my opinion regarding it.

1248 (By Mr. WIMBERLY:)

Q. It is a fact, isn't it, that all the cities in the south the size Columbus, except where they are situated so that they can get a sian water, they do go to the river for a supply?

A. I understand a majority of them do.

Q. Practically all of them?

A. I don't know that I can go only by what I understand.

1249 Mr. WIMBISH: We offer the certificate of the clerk of co cil, certified copy of the reports of the Managers of the e tion held December 4, 1904, showing the result of the bond elect

(See page 380, Volume No. 1.)

Mr. WIMBERLY: As there are a number of these issues, I sup we will discuss them on the main argument of the case?

The MASTER: I think that paper is admissible.

Mr. WIMBISH: We offer page 41 from the record kept by the c neer of the fire department.

The MASTER: Yes, I will let all of it in.

(See page 469, Volume No. 1.)

Mr. MARTIN: We offer the Minutes of the Columbus W Works Company, as found on pages 3, 4, 5, 7, 8, and 9.

(See pages 477-479, Volume No. 1.)

Mr. WIMBISH: We offer this analysis as identified by Dr. Bul (Dated July 23, 1902.)

Mr. WIMBERLY: We object to this. An analysis by the Chemist is no more than an unsworn statement unless he testifi its correctness; and I object to it because it is not sworn to.

Mr. WIMBISH: I will state that we did not know of it oursel the time Mr. McCandless was here or we would have examined on it.

The MASTER: I will let it in under the circumstances in whi has figured here and I will give it the consideration it deserve

I find in making up my report that that paper deserves
1250 cient attention to be introduced, I will call attention to that it can be gotten in the record without the objecti its not being sworn to.

Mr. WIMBISH: I want to know if it is in evidence?

The MASTER: Yes, it is in.

Mr. WIMBISH: If not, we will take his deposition.

(See page 370, Volume No. 1.)

Mr. MARTIN: We offer the Minutes of the Board of Hea found on pages, 48, 50, 52 and 53, 1902.

(See pages 471-474, Volume No. 1.)

The MASTER: In reference to that analysis, if that paper is importance to justify it, if Mr. Wimberly and Mr. Wimbish to be in Atlanta together, they can take Mr. McCandless' stat under oath. I will let it go for what it is worth.

Mr. WIMBERLY: We agree for this statement to go in the

to save us from introducing two long books to prove a negative; that the books in court show the fact that this was the first action taken by the board of health upon the matter of water or its condition or quality.

Mr. MARTIN: As far as I know that is correct.

The MASTER: All right.

Mr. WIMBERLY: That goes in subject to be modified or withdrawn if upon a more careful examination they find something to the contrary.

Mr. WIMBISH: We offer the affidavit of R. L. Johnson, who has since died, which we offer in evidence. (After argument counsel stated *that* would not offer the affidavit for the time being.)

1251 Counsel for complainant stated that they were willing to take up portions of the cast iron pipe in the system of the Columbus Water Works Co. and make a physical demonstration of the same to the Master in order that he might see the condition of the same.

Counsel for respondents stated that they had no objection to this.

Counsel for respondents stated that they would at this juncture close their case with the understanding that they might have some documentary evidence that they would want to introduce.

(Court here took a recess until the next day.)

THURSDAY MORNING, *March* 10, 1904.

Court met pursuant to recess and the hearing was resumed.

W. J. MCKERLY, sworn by the complainant, in rebuttal, testified as follows:

(By Mr. GARRARD:)

Q. What is your occupation?

A. Engineer.

Q. Have you ever been in the service of the City of Columbus?

A. Yes, sir.

Q. For how long?

A. Well, I was connected with them in '88——

Q. What?

A. In '88 and then in '89 and '90 it was I quit, off for 10 months and I came back at the end of ten months and been connected with them ever since up until 28th day of February last.

Q. February of this year?

A. Yes, sir.

1252 Q. What were you doing the night of the Columbus Iron Works fire?

A. I was running an engine.

Q. Which engine?

A. No. 1 engine.

Q. Where was that engine placed?

A. Ninth Street and Front.

Q. With regard to the Columbus Iron Works fire, what amount of pressure did you have or maintain?

A. I run with 140 and 145 pounds water pressure.
Q. Did anything happen to any of the hose?
A. Yes, sir; I bursted a couple of sections.
Q. At different times?
A. Yes, sir.
Q. What about the water supply?
A. I had plenty.
Q. How was the pressure?
A. I run from 140 to 145 all the time I played there.
Q. How was the water supply?
A. Mine was plenty. I didn't try to get over 140 or 145 pou
I thought that would give all the pressure they could handle at
end of the nozzle.
Q. That was a very large fire, wasn't it?
A. Yes, sir.
Q. What was it on fire?
A. All I know is, they were buildings that belonged to the
lumbus Iron Works Co.
Q. How about the lumber, how was it arranged?
A. I think it was kind of bird-trap like; besides there was a g
deal of it in the plow works.
Q. Wasn't there or not a large quantity of lumber stacked th
A. I was not down in that part of it and I could not say.
Q. It was a very warm fire?
A. Yes, sir.
1253 Q. How long did that fire last?
A. Well, I run there nine hours.
Q. Did you get out of water?
A. No, sir.
Q. During that time?
A. No, sir.
Q. What amount of pressure did you have?
A. I run, I suppose—well, I don't remember exactly when
taken me from Front and 9th, but at the time I left there
pressure had dropped down to about 135. After taking my suc
loose from the engine to move, I found the least bit of trash
leaves had accumulated in my strainer that is connected on th
side of the pumps to keep the trash from entering into the pu
Then they moved me on Broad. Well, at the same time that
not the cause of they moving me on Broad. A warehouse on
corner of Broad and Dillingham had caught on fire; and the en
had broken down up there and they moved me up there on
account.
Q. What engine was it that was broken down?
A. Silsby No. 5. I think Mr. Giddens was running probabl
Front Street at the time, that old engine. Probably that engi
mean, was running at the time.
Q. That's the reason they moved you?
A. Moved me on account of the fire breaking out in the
house.
Q. How was the pressure after that?

A. I had plenty. I connected with the plug on Broad and Dil-gham.
Q. As far as you saw there was plenty of pressure?
A. As far as I saw, yes, sir.
Q. This engine that you spoke of that broke down, what's the condition of that engine?
A. Well, I was not handling that one, Mr. Garrard; but the en-e is supposed to be in good condition.
Q. It broke down though?
A. Yes, sir.
Q. You are not speaking of Giddens' engine?
A. No, sir.
Q. What is the condition of that engine?
A. That engine is not safe.
Q. How much pressure was safe?
A. Not over sixty pounds.
Q. Had anybody warned them as to the amount of pressure they ld carry on that engine?
A. I don't know whether they did or not.

The MASTER: Do you mean steam pressure or water pressure?
Mr. GARRARD: Steam pressure.

Q. What is the usual pressure an engine can carry?
A. I carry from 80 to 100 pounds on this one; but the length of e we had and the pressure of the water we wanted——
Q. (Interrupting.) How much pressure did they use on the en-ne that night that you say was not safe?
A. I don't know, sir. I was not handling it.
Q. Do you get as much water pressure when you use low steam *er* ssure?
A. No, sir. You can take about 80 pounds of steam pressure and will double itself—yes, get about 100 and it will double itself in water pressure, if the engine is in perfect working order, it will double itself in water pressure.
Q. After the fire was over what did you discover to be the ndition of the engines?
A. Well, mine was all right. It was in good condition when I ut it down the next morning.
Q. How about this old engine you speak of?
A. I don't know, sir, I didn't handle that one.
Q. Couldn't you see it?
A. I didn't examine it at all, no, sir.
Q. Had any accident happened to it—did they stop using it dur-g the fire?
A. I don't know, sir, whether they did or not. I was not around ere. I was running the other one.
Q. You got plenty of water?
A. Plenty, yes, sir.
Q. Now I want to ask you about the fire that occurred on 5th venue in 1895 at sometime in the morning, do you remember,

when some 10 or 11 houses on 5th Avenue and the girls' public school was burned on 11th Street: Were you at that fire?

A. Yes, sir.

Q. Tell the court what happened to the fire hose?

A. Well, the suction connected to the engine caught on fire and burned through sufficiently to let the water fly out so it cut off half of the stream at least, may be more.

Q. What did they have to do with the engine?

A. Had to shut it down and moved it to 11th Street.

Q. It must have been pretty hot?

A. It was hot.

Q. So hot out in the street the hose burned up?

A. They caught. Suppose that was the cause of it, sparks falling on the hose or something like that. Anyway, the engine
1256 got so hot the paint began to melt on the wheels; and in fact we thought we were going to lose the engine at one time. We had to get outside help to move the engine, moved it from 5th Avenue to 6th Avenue.

Q. Sometime lost in moving the engine?

A. It was 5th up to 4th. I got that wrong. The fire was on Fifth, wasn't it? I mean from 5th to 4th.

The MASTER: The fire was on 5th avenue and the engine was stationed on 5th and the hose caught afire and moved it to 4th and 11th Street?

A. Yes, sir.

Q. Whereabouts on 5th Avenue was the fire?

A. Between 11th and 12th Streets.

Q. What was the condition of the wind that day?

A. It was pretty heavy.

Q. How far off from where the fire was located did it set fire to buildings?

A. I don't know, Mr. Garrard.

Q. How about the bagging mills?

A. Well, I don't know that that caught. I could not say.

Q. Your work was right with the engine?

A. Yes, sir; I was with the engine.

Q. Do you re-call the fire at the J. S. Garrett residence, on 2nd Avenue?

A. I was firing the engine at that time.

Q. The roof was burned off?

A. Yes, sir.

Q. Part of the house burned up?

A. Yes, sir.

Q. Well, how was the water on that occasion?

A. I never heard any complaint with our engine. I was firing the engine at the time.

Q. Do you know whether it got plenty of water?

1257 A. Yes, sir; what I saw; and I never heard any complaint from the engineer.

Q. You never heard any complaint at all on this occasion?

No, sir.
You were firing the engine?
At that time, yes sir.

he MASTER: You mean the engineer in control?
ITNESS: No, sir; I never heard any complaint from the engineer was running the engine. I don't remember anything about pressure there.

. What was the condition as to the supply of water your engine get enough, too much or not enough?
. I was not handling it at that time.
. Couldn't you tell?
. Well, I don't remember. I could not say.
. Well, do you know anything about the fire on 6th Avenue, one story frame dwellings between 6th and 7th Street-, do you all that?
. I was not at that fire.
. Do you re-call the fire at the residence of the late Colonel ift on 12th Street and Third Avenue, two story brick house?
. Yes, sir.
Q. Well, how was the water supply at that house—that fire?
A. I had a good supply there.
Q. Were you running the engine?
A. Yes, sir.
Q. What plug did you connect with—on what street did you——
A. I was on 12th Street.

The MASTER: 12th and Third Avenue?
A. Yes, sir.
Q. Well, now the St. Paul's Church Fire that occurred in 1901, you re-call that fire?
A. Yes, sir.
58 Q. Do you re-call any of the circumstances in regard to that fire?
A. Well, I had a little trouble there.
Q. What was the trouble?
A. I could not get the water.
Q. Well, what sort of an alarm was it?
A. When I first started to playing there I could not get water fficiently. I don't suppose I could play over 80 pounds.
Q. You wanted more?
A. Yes, sir; I could not get enough to supply my engine with o streams. After I played there awhile, Mr. Preer came along d opened up a valve near by where I was running and after that e pressure was a little better.
Q. Do you know whether or not the fire alarm was turned in so to start the pumps and to get the benefit of the Rose Hill standpe at that fire?
A. Possibly I remember there was a telephone message.
Q. Where was that telephone message sent from?
A. I don't remember.

Q. After the attention of the superintendent of the water works company was called to it you got plenty of pressure?
A. It was better, yes, sir.
Q. Do you re-call the R. C. Golden fire in 1902?
A. That was between 12th and 13th Streets.
Q. On 5th Avenue, 1220?
A. Yes, sir.
Q. Well, did you get water at that fire?
A. No, sir; I was bothered there. After I opened up the engine to run and run I suppose may be a minute, something like
1259 that, the water stopped entirely; and I was worried there getting the engine started to running and get water. The chief sent some one back to know the trouble, wasn't getting any water through the nozzle; and after he left I kept working with it—I had about 60 pounds of steam; and I opened my throttle right wide and started to playing; and after I shut down I found the trouble. The suction had filled with trash and leaves and by opening up the suction was so great it tore the strainer loose at the top and the water passed in over the top of the strainer and then I had plenty, after I got started. I suppose I lost two minutes.
Q. Were both engines on the same line?
A. I think it was. I think probably No. 4 was playing out there on Sixth Avenue and 13th Street.
Q. Playing on the same line?
A. Playing on the same fire, you mean—they were connected to the same main.
Q. Same line of mains?
A. I think so. I don't know how the mains run there.
Q. Couldn't they have gone to the corner of that block and been connected with an eight inch main?
A. I don't know how the mains run.

The MASTER: Which block do you mean, 6th Avenue?
Mr. GARRARD: 12th Street and 6th Avenue.
The MASTER: 12th and 6th or 12th and 5th?
Mr. GARRARD: 12th and 6th.

Q. How about the fire of May 30, 1902, near Golden's Foundry, St. James' Alley?
A. I was running an engine there.
Q. Did you get any water?
A. Yes, sir; plenty.
1260 Q. How much?
A. 140 or 145 pounds.
Q. 140 to 145 pound*d*?
A. Yes, sir; water pressure.

Cross-examination.

(By Mr. MARTIN:)

The MASTER: You mean water pressure through the engine?
A. Yes, sir; at the engine. That's what my gauge showed me at the engine.

Q. At the Columbus Iron Works' fire where was your engine stationed, what hydrant?
A. At 9th and Front.
Q. What size main was there?
A. Six inch.
Q. Now when you say you got 140 pounds, you mean that was the pressure recorded by the engine?
A. Water pressure at the engine. That's what I mean, water pressure at the engine, what shows on my gauge at the engine.
Q. Was that the pressure afforded by the mains or was it the pressure obtained by the use of the engine?
A. That's the pressure obtained from the use of the engine.
Q. Do you know the pressure was there that night without the engine?
A. No, sir.
Q. You won't undertake to say what it was at the time?
A. No, sir.
Q. Do you know what it was down where the other engines were?
A. No, sir.
Q. How long had you been running there before you moved to Broad Street?
A. I don't know, sir. I don't remember when they moved me whether it was after 12 or not; but it was somewheres about then.
1261 Q. Don't frequently happen when one engine is on one corner and another one on the next corner, same main, but different hydrants, that one gets water and the other does not?
A. We have had it to happen that way once or twice—worry them awhile, yes.
Q. You don't know what it was in the other engine below there?
A. No, sir.
Q. On the same street?
A. No, sir.
Q. You don't undertake to say what the pressure was outside of the engine there?
A. No, sir.
Q. You spoke of the engines having broken down, you know that they broke down?
A. Except what they told me. The chief, I think it was, told me that it was broke down.
Q. You don't know it of your own knowledge?
A. No, sir.

Mr. MARTIN: We move to rule that out.
WITNESS: Chief Burrus told me it was broken down. He was in charge of the fire at the time.
The MASTER: When did he tell you that?
WITNESS: I don't remember the time.
The MASTER: Did he tell you at the time of the fire that the engine was broken down—while you were working on the engine?
A. Yes, sir; told me during the fire.

The MASTER: I will overrule the objection.

Q. What did he tell you?

A. I don't remember the time but he told me during the fire.

Q. The fire lasted all night into the next morning?

1262 A. I think I shut down about a quarter after five the next morning the best I remember.

Q. You don't know what time it broke down or what was the cause of the break-down?

A. No, sir.

Q. It was a very severe fire?

A. Yes, sir.

Q. It took the full capacity of your department, didn't it?

A. Yes, sir.

Q. You don't know what was the trouble with the other engines?

A. No, sir.

Q. You say on 5th Avenue between 11th and 12th Sts. you were at that fire?

A. Yes, sir.

Q. Do you know what the water pressure was without re-enforcement by the engine?

A. No, sir.

Q. You don't know what it was?

A. No, sir.

Q. You don't know whether the firemen, before the engine got there, could, without the use of the engine, throw water on the houses or not, do you?

A. No, sir.

Q. When you got your engine attached you brought up the pressure?

A. That's all, yes, sir.

Q. What size main did you have there?

A. Six inch.

Q. At this other fire in St. James' Alley, you said you were there?

A. Yes, sir.

Q. Where 11 houses burned up?

A. Yes, sir.

Q. That was by use of the engine?

A. Yes, sir.

Q. You don't know when the firemen first got there before the engine, what the pressure was?

A. No, sir.

Q. Haven't you been to fires many times before the engine

1263 was attached you could see the water when it would not reach to the roof of the building: Hasn't that been your experience many times?

A. I don't remember.

Q. Haven't you noticed it many times when you had the nozzle yourself you could not get any water?

A. I have seen it at one or two fires but I don't remember the fires though.

Q. You have had that kind of experience, haven't you?

A. I can't call the dates or the fires.

Q. I didn't ask you to call the dates or the fires: I asked you if you had had that kind of experience?

A. I remember seeing once or twice that we could not get water on top of a two story building, something like that.

Q. Haven't you seen it when you could not get it up on top of a one story building?

A. I don't remember.

Q. I will ask you to see if you didn't sign this affidavit: That's your signature? (Handing witness paper.)

A. Yes, sir.

Q. Now take your time and read that affidavit over please? (Witness reads affidavit.) You signed that affidavit?

A. Yes, sir.

Q. The facts stated in that affidavit are true?

A. Yes, sir; I don't charge its being untrue.

Q. I didn't ask you that: I asked you if the facts you swore to in that affidavit are true?

A. Well, do you mean——

Q. I mean the facts that you stated in that affidavit that
1264 you swore to, is that the truth?

A. Well, yes, I guess it is.

Q. That's the truth then, is it?

A. Yes, sir: There is only one thing we never done exactly, that is, to shut the engine down to clean out the leaves from the suction.

Q. You didn't state that here, did you?

A. I see there that they have got that in one place it has been shut down and cleaned.

Q. Ain't that a fact?

A. That was after we were through.

Q. They were cleaned though?

A. We cleaned them.

Q. And found leaves in them?

A. Yes, sir.

Q. Just as stated in here?

A. Yes, sir.

Q. That's the truth, isn't it?

A. Yes, sir.

Q. You cleaned it at the Golden fire?

A. After we shut down—after the fire was out.

Q. Didn't you do it before?

A. No, sir.

Q. Didn't you testify a little while ago that it took you a minute or two?

A. No, sir: I said the leaves, and trash sufficiently accumulated in the suction to cut the water off; and after we worked there with it awhile I opened up the engine and got sufficient pressure to tear the strainer loose about the top, half way around, and the water passed in over my strainer into my pumps. I never taken my suction loose.

Q. But you cleaned it?
A. Yes, sir; after the fire was over.
Q. And you found leaves and trash in it?
A. Yes, sir; found that caused the water to stop and tear the strainer loose.
Q. Were you at the mattress fire?
A. No, sir; I was off at that time—off duty.
Q. At the Garrett fire, do you undertake to say that the pressure not supplemented by the engine, was sufficient to throw the water on the house?
A. As I said awhile ago I was not the engineer at that time; but I heard no complaint from the engineer.
Q. When you got there the firemen were already there using the hose?
A. I don't remember about that. I was with the engine.
Q. Now I will read this to you:

Mr. WIMBERLY: He has stated that it was true.

Respondents stated that they wished to read the affidavit to the witness and then offer it to impeach him, which was objected to by the complainant and objection overruled.

Q. I will read this to you: (Reading) "Personally appeared before me, the undersigned officer in and for said county—I will omit the other names except W. J. McKerley, each of whom being duly sworn say: that they are members and employees of the fire department in the City of Columbus, and as such they have been perfectly familiar with the water supply which has been furnished by the Columbus Water Works Company for the last several years. Deponents say that most of the mains within the city of Columbus are entirely too small to furnish water in sufficient quantity at the required pressure, and to do effective service at fires and that the pressure of said water has been most of the time below thirty-two pounds to the square inch; and that during the summer and fall months and in seasons of low rain fall, the supply of water is not adequate to enable the fire department to protect the property of the citizens of Columbus against loss by fire, and that it has frequently happened, within the last few years, that the fire department has been unable to get water in sufficient quantities and at sufficient pressure to throw a stream of water on a single story house" * * * and that it has often happened that the leaves, trash and other filth coming through the mains, has gotten into the fire engine and had to be cleaned out before effective work could be done. Deponents further swear that during the summer and fall of 1902, that the supply of water from the reservoirs of said company in Alabama, completely failed. * * *"

That was sworn to on the 19th day of September, 1903. Signed by W. J. McKerley and sworn to by him. Now you say you signed this?
A. Yes, sir.
Q. The facts I have read from this affidavit are they or not true?
A. Yes, sir.

Q. You say you attended the St. Paul's Church fire?
A. Yes, sir.
Q. How did you go?
A. The chief pulled the box for me to come out there.
1267 Q. When that is done don't that give notice to turn on the water?
A. Yes, sir; I turned the water on in the engine house as soon as I was telephoned.
Q. Then the water was turned on?
A. At the engine house, yes, sir.
Q. You say you remained with the fire department until the 23rd of last February?
A. Yes, sir.
Q. Where are you working now?
A. With the Columbus Water Works Company.

Redirect examination.

(By Mr. GARRARD:)

WITNESS: Mr. Garrard, might I ask one question?
Q. Yes?
A. I wanted to know this: I have been questioned on the engine pressure—engine—water pressure from the engine.
Q. That's true?
A. Yes, sir.
The MASTER: What is it you want to know?
WITNESS: That's the pressure you want to know. At the Columbus Iron Works fire it was engine pressure.
Q. That's what I asked?
A. Yes, sir.
Q. Do you know anything about a private standpipe of the Columbus Iron Works?
A. No, sir.
Q. There was a standpipe there?
A. Yes, sir; one there.
Q. Do you know who it belonged to?
A. No, sir.
Q. Do you know whether this water you referred to as going to the second story of the house, what length of hose it was pumped through?
A. No, sir.
1268 Q. You don't know whether it was through 100 feet or 200 feet?
A. No, sir.
Q. Or a thousand feet?
A. No, sir.
Q. What effect would that have?
A. I don't know, sir. I don't know the effect.
Q. Do you know anything about the sizes of the mains?
A. No, sir.

Q. Does anybody in the city's employment know or understand about the sizes of the mains?

A. I don't know, sir.

Q. Mr. Pearce ever call your attention to the sizes of the mains in the City of Columbus?

A. Well, I think he has asked me sometimes about them,—told me something about it at different places—certain places, the sizes I would be connected to with the engine.

Q. Did you ever hear Mr. Pearce say anything about the sizes of the mains leading from 17th Street up to the standpipe, whether it was a six inch or an eight inch pipe?

A. I don't remember.

Q. Do you know whether Mr. Pearce knew what the sizes of the mains were?

A. I don't remember that.

Q. You say you went in the employment of the Columbus Water Works Company in February of this year?

A. Yes, sir.

Q. How come you to quit the employment of the city?

Objected to as irrelevant and objection overruled.

Q. How come you to quit the employment of the city?

1269 A. My feelings towards the city were good and have been good ever since I was connected with it. I quit because I was accepting a better position.

Q. Were you recommended by any one connected with the city department?

A. No, sir; not that I know of, unless Chief Pearce spoke about me. I don't know that he has. I never have heard.

Q. Did you quit there on account of any trouble at all?

A. No, sir; none at all.

Q. This affidavit you spoke of, quite a number of firemen signed it, didn't they?

A. Yes, sir.

Q. Did you say anything in that affidavit about the Columbus Iron Works fire?

The MASTER: That speaks for itself.

Q. You stated to Judge Martin that when you received the telephone message you turned in the Rose Hill pressure at the time of the St. Paul Church fire?

A. Yes, sir.

Q. At that time was there any arrangement by which the pumps were notified?

A. Well, we have—yes, we have got two signals that notifies them.

Q. That was done this year, wasn't it?

A. Yes, sir.

Q. Was it at that time?

A. At that time I don't remember whether there was or not.

1270 H. C. GOETTING, sworn by the complainant, testified as follows:

(By Mr. GARRARD:)

Q. Where do you reside?
A. I am working for the Express Company now; and live at 521 East 19th Street.
Q. What were you doing prior to going with the express company?
A. I was working for the city fire department.
Q. In whose employ were you at the time of the Columbus Iron Works fire?
A. I was working for the city fire department: as stoker.
Q. What were you doing on that night?
A. I was firing an engine.
Q. What engine?
A. No 1 steamer.
Q. Were you engineer at any time during that fire that night?
A. Yes, sir.
Q. On what engine?
A. The old No. 5—old reserve steamer.
Q. What was the condition of that engine?
A. Which one?
Q. Old No. 5?
A. Well, I don't know personally, never heard. I think Chief Pearce told me once that its boiler had been condemned by Mr. Golden.
Q. What was the condition of it on that night?
A. Up to two o'clock it was all right, sir.
Q. That in the line of Mr. Pearce's duty?
A. This was not at that time, it was prior to that time.
Q. Mr. Pearce, what position did he hold?
1271 A. He was assistant chief.
Q. At the time he made that statement to you?
A. Yes, sir.
Q. How long before the fire was it?
A. Well, I reckon soon after I taken position as stoker at No. 1.
Q. How long before the fire?
A. I reckon about a year.
Q. Did anything happen to the hose that night?
A. Yes, sir; we bursted one or two sections with No. 1 steamer.
Q. Anything happen to the hose on the steamer you referred to?
A. No. 1 steamer?
Q. No. 5?
A. Yes, sir; I bursted two sections..
Q. That makes how many, four sections in all?
A. Yes, sir; I reckon so.
Q. How about the other, any hose bursted?
A. I don't know anything about the others at all.
Q. How much was the pressure run up to on No. 5 steamer?
A. Where do you mean? I was at two places.

THE MASTER: When you were running No. 5 steamer?

A. I know: I had to move from one plug because I could not get enough water. At half past eight o'clock Chief Burrus ordered me to take charge of the old steamer at the corner of 8th and Front; and I went down there to run it; and when it started it could only maintain about 35 or 40 pounds water pressure; so I called the chief's attention to it and also Mr. Keene and Mr. Springer, they all called his attention to it; and they decided to move this old steamer
1272 up to Broad and 8th; and I got up to Broad and 8th and carried 65 pounds of steam and maintained a pressure from 90 to 110 pounds. Had 110 at one time and I bursted two sections of hose and I reduced the pressure down to 90 pounds and I held it until Chief Burrus moved me from there to Dillingham and Front.

Q. From 90 to 110?

A. Yes, sir.

Q. With 65 pounds of steam?

A. Yes, sir.

Q. Why couldn't you take on more steam pressure?

A. I was scared. The boiler had been condemned, so I had heard and I didn't care to risk my life or get scalded by putting any more pressure on the boiler. The boiler wasn't safe.

Q. You could have gotten higher water pressure with more steam pressure?

A. Yes, sir. The mechanical parts of the engine were all right. It was the boiler that was unsafe.

Q. Suppose it had been safe to have run that pressure up to 80 pounds of steam, what would have been the effect?

A. I ought to have doubled the water pressure.

Q. Then state, from your own knowledge, what was the condition of that engine?

A. Well, I think the engine is pretty good except what I have stated. She run pretty well with what steam pressure I could carry on her. Done pretty efficient duty. Wasn't out of service—couldn't say it was out of service but about 5 minutes until I could repair the feed to the pump of the engine. Otherwise she was all right.

Q. You could only carry a certain amount of steam?

1273 A. I so stated that before, sir.

Q. Who was Mr. Golden?

A. At the foundry, out there at Golden Brothers.

Q. Did he ever examine this engine?

A. I suppose he did. I don't know, Mr. Garrard, of my own personal knowledge.

Q. Who did you get your information from?

A. From Chief Pearce and Captain Munn told me it was not safe over 60 or 65 pounds of steam.

Objected to and objection overruled.

Cross-examination.

(By Mr. MARTIN:)

Q. You couldn't get water down there on Front Street could you?
A. I got about 40 pounds pressure.
Q. That steam pressure?
A. No, water pressure.
Q. Not with the use of the engine, what was it?
A. I don't know what the pressure on the water pipe was at all.
Q. You got about 40 pounds pressure?
A. Yes, sir.
Q. By using the engine?
A. Yes, sir.
Q. That wasn't enough to do any good?
A. No, sir.
Q. You had to move it?
A. Yes, sir; we moved it. I was scared to stay there.
Q. You said that the engine broke down?
A. Yes, sir; the feed pump to the engine.
Q. How long did it remain out of service?
A. I went up there and had a very good head of steam and I tried to run two good streams from Dillingham and Front but I could not maintain the pressure high enough on my water pumps
1274 to force the water direct into the boiler, my feed pump was broken down, could not get any water in and I had to shut down and opened the check valve and a little chip got caught in the check-valve and I cleaned that out and screwed the plug back up and the engine really was right in service immediately. I reported the matter to Chief Burrus and he told me to stay out of service, didn't think he needed her any longer.
Q. The fire had run its course?
A. Chief Burrus ordered me, him and Mayor Chappell, thought the bridge was going to catch on fire and wanted that steamer to try to get a sufficient supply of water to put the bridge out if it should catch on fire.

1275 G. T. PREER, sworn in rebuttal (re-called), by complainant, testified as follows:

(By Mr. GARRARD:)

Q. These are the only occasions during the time covered by the report, between these hours the pressure dropped below 32, that right?
A. Yes, sir.
Q. You give only one figure here, except where there is a wide discrepancy, like some very low, probably 30, 29 and 28; that's the only figure you give, say 30 pounds on September 1st and 29 pounds on September 2nd?
A. That was the actual pressure.
Q. Did you get the lowest pressure at that time or the highest during that 10 hours or how?

A. In the whole statement there may be 2 or 3 places where Mr. King and myself simply agreed upon the average. If it went a little below a certain line or a little above during that hour, where it was some above and some below, we simply struck an average. In all cases, with that exception, the pressure as written there is what it actually was.

Q. In other words the actual pressure during that time?

The MASTER: He says actual pressure with a few exceptions.

WITNESS: Some hours of the time in going over the average for the day: for instance, half of the water pressure would be above say 30 and the other half a little below. That would be about 29.

Q. Generally speaking, was that the pressure during the whole time?

A. The whole time? Didn't examine the other hours
1276 thoroughly.

Q. That whole hour?

A. Yes, sir.

Q. That was the pressure during the whole hour?

A. Yes, sir.

Q. Now on the date like the second one here, May 3rd, you have got it from 1 to 2: you didn't copy between 9 and 10, wherever it is blank on that day?

A. It was above 32.

Q. September 2nd, 30?

A. 30. That's September 30. Where it is down to "0" is on 12th of November.

Q. 12th of November, '99: I want to ask what did you find about that record. You have put it down there at zero?

A. Nov. 12, 1899, we found it at zero between 9 and 10 A. M. For my own satisfaction, I would like to say I made a note on my copy at 7:30 A. M. the pressure was 40 pounds and at 10:30 A. M. the pressure was 30 pounds, which shows that there either must have been a break or the water was cut off for some purpose.

Q. Are there any other places on this list that you want to make any explanation about: You told me there were several?

A. Yes, I made several notes on my original copy.

Q. Call attention to it, please.

The MASTER: Refer to your memorandum and then look at the paper?

A. On the 17th of May, '98 we stated the pressure there between nine and 10 A. M. from 18 to 35 pounds. That seems to me to be unusual. I made a note on the record I took this from, at 9:30 the pressure was 35 pounds. At 10:45 the pressure was back to 35
pounds. That indicated that there must have been some-
1277 thing unusual. Between that time and noon the pressure dropped as low as 18 pounds.

Q. Are there any other places in there that I can get at quicker that way?

A. My notes are on here. (Referring to copy in hand.) There are

some notes that I will omit. In going over this on September 14, '01, between 9 and 10 A. M., the record showed 31 pounds. Between 1 and 2 P. M., 21 pounds. That being a considerable drop in the pressure I examined the record further and found that at 10:30 A. M. the pressure was 30 pounds and 9 P. M. back to 32, which indicated that there must have been something unusual, either a break or part of the city cut off.

Q. On the 28th of February, 1902, between the hours of 9 and 10, you have on the statement sworn to there, zero to 10 pounds "bridge washed away"?

A. Yes, sir.

(By Mr. WIMBERLY:)

Q. How is that water gauge located where these readings are made?

A. At No. 5 engine house.

Q. How far above the floor of the engine house is it?

A. Just from looking at it I judge it is about 4½ feet from the floor.

Q. Did you examine the gauge at the time of the Columbus Iron Works fire?

A. I looked at the day that Mr. King told me was the Columbus Iron Works fire. I don't know of my own knowledge that was the date.

Q. What did you find the gauge at the time?

A. I found the pressure seemed to go up about 7 o'clock above 40 pounds. Varied between 40, about 44 for may be 15 or 20 minutes and then worked down to 30. Run along a little above and
1278 a little below 30 until about 12 o'clock and then it went up higher and remained higher until sometime the next morning. I didn't notice the hours exactly.

Q. The lowest it dropped?

A. A little below 30. I should — averaged about 30 from 7 and 8 to about 12. I didn't make any particular note of it.

Q. The engine house is in the lower part of the city?

A. Yes, sir; below 10th Street, on First Avenue.

Q. There is a great deal of reference in the testimony to a standpipe in the yard of the Columbus Iron Works: whose standpipe is that?

A. Well, sir, it is known to belong to the Columbus Iron Works; and I always believed it did.

The MASTER: Haven't you been all over that?

A. I really testified to that standpipe in my first testimony.

Q. Does it belong to the water works company?

A. No, sir; it does not.

Q. In the yard there what other connections have they to supplement the standpipe?

A. They had a two inch connection with our mains and a meter on it.

Q. From the standpipe have they got fire hydrant connections?

A. I could not say, no, sir.

Cross-examination.

(By Mr. MARTIN:)

Q. You stated on September 21st, 1901, that the pressure dropped down from 31 to 21 pounds?

A. September 14, 1901: yes, sir.

Q. That's the point you wanted to make an explanation
1279 about?

A. Yes, sir.

Q. That was between one and 2?

A. Between one and 2 it was 21.

Q. Between 9 and 10 it was 31?

A. Yes, sir.

Q. Isn't it a fact that along about that time there is a great deal of water used, between 9 and 10 and between one and 2?

A. Yes, sir; all day, from six o'clock in the morning until nine o'clock at night.

Q. At those hours there is probably more water used than at any others?

A. I could not say. I simply don't know. I think the use of water runs along about equal the other hours of the day.

Q. You don't say it is not a fact that more water is used between one and 2 than during the other hours in the day?

A. It is not a fact?

Q. You don't say it is not a fact that there is more water used between those hours?

A. I simply could not say. I think there is more water used in the afternoons when they are sprinkling lawns, etc.

1280 JAMES J. SLADE, sworn by the complainants in rebuttal, testified as follows:

(By Mr. GARRARD:)

Q. During what years were you Mayor of the City of Columbus?

A. I think it was from the latter part of '91 for four years succeeding that. I was Mayor two terms.

Q. Do you re-call the fire known as the Preer fire?

A. Yes, sir.

Q. At Mrs. Preer's?

A. Yes, sir.

Q. Do you re-call an investigation in regard to the use of a certain plug near Mrs. Preer's that was not in working order?

A. Yes, sir.

Q. Who held that investigation?

A. I ordered the investigation.

Q. Were you present at the investigation?

A. I was present, sir and took charge of the investigation, sir.

Q. You——

A. (Interrupting.) I thought it was my duty as the executive of the city to see that the city received no detriment from such a plug being in existence.

Q. State what you did?

A. Upon the statement of facts from certain parties that the plug would not run that night when the engine was attached to the plug and the spanner turned, that the water would not flow—would not go into the engine and there was also a statement that the hose had been attached first and that nothing but mud ran from the hose into the Preer yard and that the hose was full, no question of
1281 its being full because parties stood on it and knew it was full of something but did not run but a very short distance through a little spout and then it ran mud and then the engine was attached to the plug and it could not draw it out, parties thought there was an accumulation of mud in the end of the pipe—the main. I understood it was a little end off from the main run of the water pipes.

Q. Did you investigate the matter fully?

A. I called the committee of council and had the witnesses before me about the matter; and the chief said that the plug ran with great freedom after the fire was over. He went there, attached a spanner and opened the plug and it ran without any show of mud, perfectly clear, fine water as could be desired, no mud about it. He didn't see any sign of mud anywhere. I carried the investigation a little further on and commenced to draw some parties into trouble, who we were satisfied were drinking a little too much that night and that accounted for the engine not drawing water; and I immediately stopped the investigation, having found nothing to satisfy me that the city was not at any detriment on account of the defectiveness or wrong action of the plug. I then tried to take care of these men by not pushing the investigation any further and I stopped it right there. We became satisfied that there was nothing the matter with the plug. That was the committee's conclusion.

Q. You say the chief turned on the spanner?

A. Yes, the chief turned—I believe you call it a spanner
1282 that turns the plug—opens the plug.

Q. I won't ask you the name of any party because I don't want to drag any names into it; but I want to ask you did any other person attempt to open that fire plug: What did the chief say as to how the spanner was turned?

A. The chief didn't say anything about how the spanner was turned, sir. Other parties testified to the condition of these men who attempted to turn it.

Objected to what other parties said.

Objection sustained.

Mr. GARRARD: I want to show: I can't ask a leading question: that the water works company after a thorough investigation, was found not to be at fault.

The MASTER: He has stated the result of the investigation.

Mr. WIMBISH: We won't object to his putting that leading question if he wants to put it.

The MASTER: I will let you go into that?

WITNESS: We discovered it was not at fault at all. I found I had done my duty for the city and then I closed the investigation.

Q. Did you make any report to council?

A. I don't re-call that I did, sir.

Q. Didn't you address a communication to council in '94 in which you referred to the Preer fire?

A. Yes, sir. I read a paper before the council.

Q. It refers to a great many other things; but I will read a part which I think refers to this: (Reading:) "There is a fable about the Preer fire, that a plug did not respond to the engine's
1283 suction. But when the spanner was applied by a man whose head is always level, and composure in danger is a characteristic, the water ran from the plug as clear as a spring branch. I defy proof to the contrary of this statement, that there has been a ready and ample response of water at every and any fire the engines have reached in time, and that the record of the promptness of the engines and fire department is unbrokenly good, as the fire waste of our city verifies." You read that report to them?

A. I did, sir. That was always my convictions about it, sir. I made it my special business to see that the city was not injured in any way by association with the water company; and that was one of my investigations for that purpose.

The MASTER: This paper was made in 1894; that occurs in this paper signed by James J. Slade?

WITNESS: I made it in a regular meeting of council. I could not date it because I did not know what time I would read it. It was published just——

Q. Was this an official communication?

A. Yes, sir; that was an official communication.

Q. And signed by yourself?

A. Signed by myself as Mayor.

Q. The original was left on file?

A. Yes, sir.

Q. Did you ever meet a gentleman by the name of Hall?

A. Yes, sir.

Q. B. M. Hall?

A. Yes, sir.

Q. Where did you first meet him?

A. I met him one day on Broad Street when he had been here about two weeks, I think, making an investigation of the
1284 Roaring Creek Watershed, etc. He wanted some money and he came to me, or the committee that had him in charge, to get me to sign for the payment of some money by the city.

The MASTER: You were Mayor at that time?

A. I was Mayor at the time, yes, sir.

Q. How did he impress you?

Objected to and objection sustained.

Q. Was anybody trying to sell a water-shed here at that time—you hear of it?

A. Yes, sir.
Q. Did you know that?
A. Yes, sir; I know the parties that were trying to sell a water power and shed.

Objected to and objection overruled.

Q. What about Roaring Creek: Do you know anything about Roaring Creek?
A. Yes, sir.
Q. Did it bear that name before that time?
A. Been known as that for some time.
Q. Did you ever see it dry?
A. Yes, sir.
Q. You say you have seen it dry?
A. I have seen it dry, yes, sir.
Q. How many times?
A. Once.
Q. Was that the creek that Mr. Hall spoke about getting the water supply from?
A. Yes, sir.
Q. Do you know that paper? (Handing witness paper.)
A. Yes, sir.
Q. What is that paper?
A. This is the report made to the committee that was appointed to investigate the water question, made by Mr. Hall, after an examination of the different watersheds about here.

1285 Q. Well, just state what happened to that report, how long it remained in the possession of the committee and what changes were made in that report?

A. Well, I belonged to the committee that was appointed to investigate—the committee from council and a committee of citizens. They met maybe twice and then they appointed a sub-committee, which took the work out of the other part of the committee's hands; and I never could get any more information about it until they had sent off and got Mr. Hall to come down here; and when he came—when I heard he had come, I asked them to have Holland's Creek, of the water works company, investigated first; because I thought it was the safest for the city in the way of saving expense; and if he investigated that and found it all right, that sufficient water might be impounded there, I supposed there would be no necessity for further investigation; and then the city could make a trade with the water works company that would be satisfactory and would quiet the apprehension about having sufficient water. I could not get in communication with him at all. I didn't see him until he wanted some money in about two weeks, I saw him. He had finished his investigation and had handed in his report to the committee, it was reported—stated he had reported but they kept it from my view I think for about three weeks. I could not get sight of it. Wouldn't let me see it; but gave me one excuse after another

about it. Other citizens about town who did not belong to
1286 the committee had seen it and I wanted to see it myself;
but they wouldn't give it to me. I met Mr. John Clegg, who was a member of the committee and I insisted on getting it. He said that they would let me see it in a day or two. I says, why cannot I see it now? He says "It is not here now." I says "Where is it?" He says "It has gone to Atlanta." I says What for? He says "For some corrections." I says "What corrections?" He says something about——

Objected to as illegal, improper and immaterial.
Objection sustained as to conversation with said Clegg.

Q. How soon after that did you see the report?
A. I saw it in about three days afterwards.
Q. What was the condition of that report?
A. The report had to come into my hands for publication. That's the reason I asked Mr. Clegg about it. I would not have gone to him about it at all. It was stated in the resolution of council that it should be handed to me for publication. I had the publication of it. When I got hold of it, my attention had been called to corrections in it that had to be made about Chattahoochee River water; and when I took it home to read the report, I thought it had a little stiffer feeling, certain pages had a stiffer feeling than the others, which attracted my attention. I looked to see what was the subject and I discovered that it was on the subject of Chattahoochee River water. That carried me back to what Mr. Clegg told me about
Chattahoochee River water; and upon investigation—I held
1287 it up to the light, I discovered that there were two sets of
reading matter, one had been put down— pasted down very carefully over the other; and my curiosity got up to see what it was; so I put it in a little warm water and separated it; and I got this as the report that went from here to Atlanta and this piece that was on the two pages of the corrected report on the Chattahoochee River water as it came from Atlanta.
Q. Read the report as it went to Atlanta and read the report as it came back?

Objected to as irrelevant.
Mr. GARRARD: We don't offer it to discredit Mr. Hall's report or to impeach him.
Mr. WIMBERLY: We disclaim any attempt to impute a corrupt motive to Mr. Hall.

(By the MASTER:)

Q. Was that paper filed in council?
A. No, sir; it has been in my possession ever since the publication of the Hall report.
Q. Is it an exact copy of the report?
A. Yes, sir.
Q. Why isn't it in the records of council?
A. I don't know that they ever demanded it of me. I had it in

my possession and kept it in my possession—preferred to keep it in my possession.

Q. It properly belongs to council?

A. I reckon it does belong to the city.

The MASTER: I am not clear in my mind about admitting that paper because it does not come in the right direction. I hardly think I can admit that paper as the property of the City Council of
1288 Columbus. * * * You have proved the fact and it is in evidence, that Mr. Hall changed his report before it was finally submitted to council, upon a material question, as you say. I suppose you want to prove that fact. It is in evidence and it has not been objected to; and if that paper comes properly certified, I will pass on it then.

(By Mr. GARRARD:)

Q. What evidence, if any, did the Columbus Water Works Co. show as to what was their disposition, in regard to their actions?

A. They made several propositions to council to do what the city desired done——

Objected to on the ground that the same is of record and the records speak for themselves.

WITNESS: I can't remember them to quote them; but they made propositions in the shape of resolutions. The impression they made upon me is all I can tell you.

Q. You were mayor of the city at the time?

A. Yes, sir.

Q. What was that impression?

Objected to.

The MASTER: The communications were in writing?

Mr. GARRARD: Yes, sir; but they were addressed to the Mayor.

Objection sustained.

Q. I will ask you what prevented the City of Columbus and the Columbus Water Works Co. from getting together on a contract?

A. The resolutions of council.

1289 Q. What resolutions?

A. I would have to have the record to show you, sir.

Q. I will read this to you: Were you Mayor April 1, 1896?

A. No, sir.

Q. When was the last year you were Mayor?

A. It was in '95.

Q. What time in '95 did you cease to be Mayor?

A. I think it was in December, sir. I have not charged my memory with it by any writing; and I can't tell you exactly; but it is my impression——

Q. Did you ever as Mayor, make any investigation as to what adjustment of this water question could be made?

A. Yes, sir.

Q. What was the result of that investigation?

A. I became satisfied that the water company could furnish plenty

of water and that they would furnish plenty of water for Rose Hill and the Highlands and place plugs where they wanted them and stop dead ends, and the like of that, with a proper agreement with the city.

Q. That was the service above 17th Street?

A. Yes, sir.

Q. How was the service up to 17th Street at that time under the contract with the city?

A. The service, I suppose, was fairly good, sir. As far as drinking water was concerned, I had good drinking water all the time. I never filtered any of it. I made an investigation, as mayor, of the fires that occurred, the supply of water at the fires and found

1290 that there was plenty of water for ordinary fires with anything like where they could get to the plugs. There was a condition of things down here at the Phillips' fire, around on 4th Avenue, could not handle anything at all at that fire, the fire got to heavy for them, not able to do anything. The water was very greatly used or exhausted by the time the fire changed from that street. Wherever there was an effort made to get water, the engines were there in time, and there was always plenty of water.

The MASTER: You said 4th Avenue: You meant 5th?

A. Fifth, yes, sir.

Q. You said the Phillips fire?

A. Yes, sir.

Q. Isn't it a fact that at the Phillips fire one of the engines gave out on account of the hose being burned in two?

A. Yes, sir; that's my recollection.

Q. Wasn't it a very hot fire?

A. Too hot for the men to work with the plug and they cut off and could not get the water to the fire.

Q. Didn't they have to get assistance from outsiders?

Objected to.

Q. Did they have any one to assist, outsiders or anybody else, to get the engine out of the fire?

A. I don't recollect, sir.

Q. Well, did you use the water that was furnished?

A. Yes, sir.

Q. Did you drink it?

A. Yes, sir.

Q. Did your family use it?

A. Yes, sir.

Q. Wasn't it fairly good branch water?

Objected to.

1291 Q. What about flushing sewers, who did it?

A. Well, at first the water works company did it; and there was an apprehension that may be they didn't do it sufficiently, did not use enough water, and the sanitary inspector was put in charge of it.

Q. Do you re-call the year they stopped having it done by the water company?

A. No, sir; I can't recollect; but it was during my mayoralty.

Q. Were they or not very strongly urged to give direction to that flushing?

A. Who?

Q. The City council?

A. Were they not strongly urged?

Q. To give it some direction, by the water company?

A. Well, I really can't tell you, sir, who caused it. I know there was an occasional complaint but I could not tell you whether it was the water works company did it themselves or the city asked them to do it.

Q. Do you re-call what amount the city paid the water company the last year——

A. No, sir; I could not tell.

Objected to as not being in rebuttal.

Q. Well, what did they do about flushing sewers?

A. It was changed and put into the hands of the sanitary inspector.

Q. How did they do it?

A. They did it by opening a plank and let the water run.

Q. What would have been the proper way to flush those sewers: I will ask you a hypothetical question: What amount of water turned loose at one time would have been sufficient to have
1292 flushed those sewers, if the sewer box had been constructed of the proper size?

Objected to on the ground that a hypothetical question can only be asked an expert and objection overruled.

WITNESS: Well, it depends entirely upon the size of the sewer and the build of the sewer. If the sewers are built sloping at the bottom, inclined that way, a very small quantity of water would flush it out clean; but if built round up, it takes a greater quantity of water; would dam up around an obstruction. It might take 10,000 gallons to wash out between the two squares that form the sewer. They have got to dam according to the slope of the sewer.

Q. Was there or not any waste of water?

A. I think there was waste in the continuation of the thing, more than was expected to be—more than was intended to be.

Q. Do you re-call whether or not the water company objected to the construction that was placed upon its rights by the council?

The MASTER: While you were Mayor?

Q. As to the manner of flushing sewers, whether they should flush them with hydrant hose open at the end, or with hose with a nozzle opening?

A. I think they were required to flush them with a nozzle. Not positive though about that.

Q. (Mr. Garrard here read section XX of the contract to witness.) Were there any nozzles used:

1293 A. I could not tell you, Mr. Garrard, I would not be positive about that.

Q. The opening in the hydrant was the same size as the hose without a nozzle, wasn't it?

A. That's what I understand, yes.

Q. Wasn't there an appeal made that it was not fair to flush the sewers in the manner in which they were being flushed?

A. Yes, sir.

Q. But in spite of this appeal how did they flush these sewers?

The MASTER: Hasn't that been proven?

Q. How was the water applied at the public schools?

A. I don't know, sir. They had lattereens there that had to be flushed out at different times; but I don't remember the amount of water that they used to turn in on them.

Q. Isn't it a fact that water run all the time?

A. I think it did, sir. That's the only way they could be kept clean—to keep them from being offensive. My recollection is that we took that matter in charge; and had great trouble in getting the school committee to come to a conclusion about it; and finally intervened with the school board and they agreed to do what I wanted done.

Q. What do you mean by lattereens?

A. Where they have a privy with water in it. Instead of turning the filth in the basement, which commenced to give offensive odors all through the different school rooms—as soon as the board learned exactly what the condition of things was, they came to my

1294 terms without any trouble. Mr. Chappell will remember being on the Board at the time.

Q. How are the water carts fed with water in the City of Columbus?

A. There is a piece of hose attached and turned into a tank on a wagon. When it is filled that stops.

Q. Did you have any communication with the water company to ascertain what could be done in order to get water for the Highlands and Rose Hill?

A. I interested myself very earnestly to try to see if I could not get the company to make a proposition to the City Council for the purpose of settling the difficulties that seemed to exist; and I think measurably the result was these results, that is, the proposition that went in from the water works company to the city council and agreed to furnish the water.

The MASTER: Don't go into that proposition.

A. I won't; only to say generally that they would furnish water to Rose Hill and East Highlands. I was satisfied they had plenty of water. I had investigated that question, and Mr. Hall satisfied me about it.

Q. In the various communications you had with the water company, did they express a willingness to do anything?

A. Always willing to do anything that was fair and just.

Objected to on the ground that the communications were in writing.

WITNESS: I felt that it was my duty as mayor of the city to try to pacify things as far as possible; and have been mis-represented in that particular, I was so earnest in trying to settle things I was counted a partisan.

1295

Q. What prevented the settlement?

A. Resolution of council.

Q. Do you know anything about that standpipe down in the rear of Bergan's old store, who it belongs to?

A. No, sir. I have seen it there.

No cross-examination.

Mr. WIMBERLY: We will tender you Mayor Slade's report to the City Council.

Objected to upon the ground that it is not certified and does not come from the proper source and bears no date.

The MASTER: I will sustain that objection unless the paper comes in properly certified.

Mr. WIMBISH: If the minutes show that that report was presented to council and the clerk finds it on file, we have no objection to its coming in in its present form.

Both sides closed.

Reported by

GEO. C. PALMER.

Endorsed on cover: File No. 21,278. N. Georgia C. C. U. S. Term No. 482. The City of Columbus, appellant, *vs.* Mercantile Trust & Deposit Company of Baltimore, Trustee, and The Columbus Water Works Company, and W. S. Greene, as receiver thereof. Filed July 30th, 1908. File No. 21,278.

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JAMES H. McKENNEY,
CLERK.

Supreme Court of the United States.

OCTOBER TERM, ~~1909~~. 1910

No. ~~214~~. 41

THE CITY OF COLUMBUS, APPELLANT,

vs.

MERCANTILE TRUST AND DEPOSIT COMPANY OF BALTIMORE, TRUSTEE, AND THE COLUMBUS WATER WORKS COMPANY AND W. S. GREENE, AS RECEIVER THEREOF, APPELLEE.

BRIEF FOR APPELLEE.

JOSEPH PACKARD,
A. MORRIS TYSON,
Counsel for Appellee.

FILED 1910.

(21,278)

IN THE

Supreme Court of the United States

OCTOBER TERM, 1910

No. 41

THE CITY OF COLUMBUS, *Appellant,*

vs.

MERCANTILE TRUST AND DEPOSIT COMPANY OF BALTIMORE, Trustee, and the COLUMBUS WATER WORKS COMPANY AND W. S. GREENE, As Receiver Thereof, *Appellee.*

Appeal from the Circuit Court of the United States for the Northern District of Georgia.

BRIEF FOR APPELLEE.

STATEMENT.

The City of Columbus, Georgia, is situated at the head of navigation on the Chattahoochee River, about 120 miles south of Atlanta. According to the U. S. Census Reports, its population in 1890 was 17,303, and in 1900 it was 17,614. (Record, page 761.) The reservoirs of the Columbus Water Works Company are situated on the Alabama side of the Chattahoochee River, which is the boundary between Georgia and Alabama.

The appeal in this case is from the decree of the Court below (Record, page 544) in favor of the complainant on a bill filed July 30, 1903 (Record, page 1), by the Mercantile Trust and Deposit Company of Baltimore, Trustee for the bondholders of the Columbus Water Works Company, against the City of Columbus, seeking to enjoin the city from selling bonds to build water works of its own, on the grounds that such action was by virtue of certain legislation impairing the obligation of the contract of the City with the Water Works Company, which was part of the property conveyed to it as mortgagee; and was intended to deprive the bondholders of their property without due process of law; and for the specific performance of said contract and general relief.

Prior to the filing of the bill in this case, to wit, on December 23rd, 1902, the same complainant had filed its bill for foreclosure of the property, including said contract, mortgaged to it as trustee, and for the appointment of a receiver, on the ground that the Columbus Water Works Company, largely through the conduct of the City towards it, was unable to fully perform its duties under the contract between it and the City of Columbus (Record, page 299). Under this bill, William S. Greene was appointed receiver, and under order of Court receiver's certificates to the amount of $50,000 were authorized for the purpose of enlarging and improving the water works.

The City of Columbus filed a demurrer to the bill in this case upon the ground, amongst others, that the Court was without jurisdiction, because no Federal question was involved and because the requisite diversity of citizenship did not exist. Thereafter an amended bill of complaint was by leave of the Court filed (Record, page 81), offering on behalf of the bondholders to supply whatever amount might be needed, in addition to the sum raised by the receiver's certifi-

cates, to make the water works thoroughly satisfactory. An additional demurrer was filed by the City to the amended bill. Both these demurrers were overruled.

There was also a cross-bill filed October 5, 1903 (Record, page 85), in which the City of Columbus sought to have the contract between it and the Columbus Water Works Company annulled, on the ground of alleged failure on the part of the Water Works Company to carry out its contract.

After answer and replication the case was referred to the Master, and evidence having been taken before him, he filed his report on the various questions of law and fact involved. To this report exceptions were filed by both parties and argument was had before the Court. Before a decision by the Court upon the questions raised by the exceptions, the City of Columbus filed its motion to dismiss the bill, as amended, for want of jurisdiction.

The Circuit Court having dismissed the original bill on the question of jurisdiction, the case was taken by the complainant to this Court (Mercantile Trust and Deposit Company of Baltimore vs. The City of Columbus, 203 U. S. 311), in which a full statement of the case is made by Mr. Justice Peckham, who delivered the opinion. The judgment of the Circuit Court was reversed and the case remanded. Argument was again had in the Circuit Court on the exceptions to the Master's report, wherein the terms of the contract of the Water Company with the City, the question of its validity, the character of the service rendered by the Water Company and the facts in the case generally, were fully discussed. The decision of the Court having been in favor of the complainant, the City of Columbus has appealed, stating thirty-three assignments of error. (Record, page 549.)

It will not be attempted in this brief to take up these assignments of error *seriatim*. Some of them, it is conceived,

have either been disposed of by the decision of this Court at the former hearing, or are immaterial. When, for instance, all the necessary parties are brought before a Court of Equity in a case such as this, the question as to whether they should be arranged as plaintiffs or defendants is not important, though it is submitted that the arrangement of parties in this case is proper. It is deemed more convenient to discuss the questions involved, so far as possible, in the line of the opinion of the Circuit Court (Record, page 526), the conclusions and rulings of which are made a part of the decree (page 545).

The Circuit Court (page 533) states some of these questions as follows:

"The principal legal questions controlling in this case are: (1) Whether the City under its charter had the authority to contract for a supply of water for the City and its inhabitants; (2) Whether the contract in this case created a debt in violation of the Constitution of Georgia; and (3) Whether the exclusive character of the contract in this case can be upheld." These questions were all decided by the Court in favor of the validity of the contract.

In addition to these, the following questions will be discussed:

(4) How far the contract in this case was violated by either of the parties.

(5) How far the police power of a municipality can be invoked to modify or abrogate its contractual obligations.

(6) The power of a Court of Equity to so mould its decree as to grant relief upon such terms as in its judgment satisfy the equities of the particular case.

ARGUMENT.

I.

DID THE CITY OF COLUMBUS, UNDER ITS CHARTER, HAVE THE POWER TO ENTER INTO THE CONTRACT, IN QUESTION HEREIN, FOR A SUPPLY OF WATER FOR THE CITY AND ITS INHABITANTS?

In Georgia, cities, under the general welfare clause of their charters, have authority to enter into contracts with private persons for water supply. This has been repeatedly held by the Supreme Court of Georgia, and is the recognized law of the State.

In *City Council of Dawson vs. Dawson Waterworks Company*, 106 Ga. 696, the Supreme Court of Georgia says:

"That a municipal corporation may exercise the power of taxation for the purpose of providing its inhabitants with water for domestic use, as well as to provide the city with water to protect the inhabitants from fire, is the settled law of this State, and is not questioned in the present case. *Frederick vs. Augusta*, 5 Ga. 561; *Rome vs. Cabot*, 28 Ga. 50; *Wells vs. Atlanta*, 43 Ga. 67. A supply of water for these purposes may be procured by a municipal corporation either by building itself the works necessary for the purpose or by making a contract with other persons to supply the same." 106 Ga., *supra*, page 709.

In that case the city derived its power from the general welfare clause; there being nowhere any specific provision in the charter touching the subject of water supply. This is also true with respect to the city charters in the cited cases.

In *Heilbron vs. Cuthbert*, 96 Ga. 312, the same thing is held, the Court citing a number of earlier Georgia cases.

In *Columbia Avenue, etc., Co. vs. City of Dawson,* 130 Fed. 152, Judge Pardee adopts as the opinion of the Court the conclusions of W. A. Wimbish, Esq., the master to whom the case was referred. Upon this subject the master states his conclusion, as follows:

"The right of a city to do those things necessary to supply its inhabitants with water for domestic use, or to provide the city with protection against fire is the settled law of Georgia. *Dawson* vs. *Dawson Waterworks Co.,* 106 Ga. 709, 32 S. E. 907; *Frederick* vs. *Augusta,* 5 Ga. 561; *Rome vs. Cabot,* 28 Ga. 50; *Wells* vs. *Atlanta,* 43 Ga. 67. As an incident to the principal undertaking, the city possesses the power to grant the use of its streets, and to contract with a private company for an exclusive supply of water for fire protection." 130 Fed., *supra,* p. 173.

II.

DID THE CONTRACT IN QUESTION HEREIN CREATE A DEBT IN VIOLATION OF THE CONSTITUTION OF THE STATE OF GEORGIA?

The contention of the City of Columbus that the contract to pay for future water rentals created a debt, is disposed of by the decision of this Court in the *Walla Walla Case.*

172 U. S. 1, *Walla Walla City vs. Walla Walla Water Co.,* pp. 19-22.

With this agrees the decision of the Circuit Court of the United States in the *Dawson Waterworks Case,* a case, like this, arising in Georgia.

130 Fed. 152, *Columbia Avenue Savings Fund, etc., Co. vs. City of Dawson et al.,* pp. 166-172.

Although the *Dawson Case* was on appeal dismissed by this Court on the question of jurisdiction, yet the decision of the Circuit Court was not reversed or modified on the question of indebtedness, and as the decision on that point covered the precise question now before this Court, it would seem that it is authority on the point.

In the present case, the Circuit Court in passing upon this same question raised by demurrer, and on the motion for injunction, *pendente lite,* held:

"A Federal Court will follow the law as established by the Supreme Court of the United States, that a contract by a city to pay an annual rental to a water company does not create an indebtedness of the city, within the meaning of a provision of the State Constitution which would render such an indebtedness illegal, where at the time of the making of the contract in dispute the law of the State had not been settled otherwise by its Supreme Court, although that Court may have subsequently declared such contracts invalid."

130 Fed. 180, *Mercantile Trust & Deposit Co. of Baltimore vs. Columbus Waterworks Co. et al.,* Syllabus.

See also the opinion of the Court (Record, page 102).

Not only had the law not been settled otherwise by the Supreme Court of Georgia, but up to a time subsequent to the making of the Columbus Water Works contract, and subsequent to the making of the present mortgage to the plaintiff, and the issue and purchase of the bonds by the bondholders on whose behalf plaintiff sues, the decisions of the Georgia Court had been in line with the decision in the *Walla Walla Case.*

Indeed, this Court in the *Walla Walla Case* cites a Georgia case with those of States whose highest Courts hold, in accord-

ance with "the weight of authority, as well as of reason," that by such contracts no debt is created. *Walla Walla Case*, p. 20.

These earlier decisions of the Georgia Court holding the doctrine subsequently established in the *Walla Walla Case* are fully reviewed by the master in the *Dawson Waterworks Case* in the report subsequently adopted by and made the decision of the Circuit Court of the United States. 130 Fed. 152, *supra*.

The Circuit Court in the present case also reviews these decisions of the Georgia Supreme Court, quoting *in extenso* from the report of the master in the *Dawson Waterworks Case*.

130 Fed. 180, *supra*, pp. 182, 183, 184.

We may add that the decisions of the Courts of nearly all the States are in line with the decision in the *Walla Walla Case*. In fact, in the decision of the Supreme Court of Georgia in the *Dawson Waterworks Case*, the Court concedes that the ruling in that case "is in direct conflict with a decision of the highest court in the land [referring to the *Walla Walla Case*], as well as with the current of American authority on the subject."

City of Dawson vs. Waterworks Company, 106 Ga. 696, p. 714.

III.

WHETHER THE EXCLUSIVE CHARACTER OF THE CONTRACT IN THIS CASE CAN BE UPHELD.

1. In the opinion in the former appeal in this case (203 U. S. 311), this Court said: "The contract in this case pro-

vided in terms for the exclusive privilege of supplying water to the city and its inhabitants for thirty years from the date of its completion (page 320) * * *.

" * * * It would seem as if the case were really within the principle decided in *Walla Walla City vs. Walla Walla Water Company,* 172 U. S. 1; *Vicksburg Waterworks Company vs. Vicksburg,* 185 U. S. 65, again reported in 202 U. S. 453; *Davis, etc., Co. vs. Los Angeles,* 189 U. S. 207; *Knoxville Water Company vs. Knoxville,* 200 U. S. 22." (Page 322.)

Upon the remanding of the case, after argument upon the whole case upon exceptions to the Master's Report, the Circuit Court carefully considered this question (Record, page 534). After citing the recent cases it points out that in the case of *Water, Light and Gas Co. of Hutchinson vs. City of Hutchinson,* 207 U. S. 385, under the statutes and decisions of Kansas, "the City of Hutchinson was not authorized to enter into an exclusive contract." The opinion then proceeds as follows:

"The case here is more nearly like the *Vicksburg Case.* Assuming, as I have, that the City had authority, under the general welfare clause in its charter, to enter into this contract, and that it did not, as the decisions stood at the time the contract was made, create a debt in violation of the Constitution of the State, there is nothing so far as I have been able to see, and certainly nothing has been brought to the attention of the Court, under the statutes and decisions of this State, which would prevent the City of Columbus from making an exclusive contract for a limited period, if that contract was a necessary and indispensable incident to the contract for a supply of water. That such a grant of an exclusive privilege was necessary and indispensable to the main undertaking of the City seems to me to be beyond question. Considering the size of the City of Columbus at the time this

contract was entered into, and the number of its inhabitants. it would have been an impossibility to have had anyone enter into a contract of this sort, if the parties so contracting were to be met immediately, or soon thereafter, with competition from another waterworks company or from the City itself engaging in the business of supplying water to the City and its inhabitants. Such a contract would have been utterly valueless, and no one would have undertaken the expenditure necessary for the establishment of such a system of waterworks as was contemplated by this contract, and was actually established, unless they had been guaranteed an exclusive right for some reasonable period at least, for rendering the service and receiving the return expressed in the contract. Competition from other parties, or from the City, would of course have destroyed the entire value of the outlay. It is clear that responsible parties would not have entered into any such contract except for its exclusive character. This being true, it comes within the decision in the Vicksburg Case (202 U. S 453)."

After quoting at length from the opinion of Mr. Justice Day in the *Vicksburg Case* (202 U. S., pages 469-471), the Circuit Court concludes on this branch of the case as follows:

"The above language appears to be conclusive of the question before the Court in this case. The contract in that case was exclusive, and in this case it is exclusive. It was for thirty years in both cases. I do not see, either, any material difference between the local law in Mississippi and the law in Georgia at the time the Columbus contract was entered into. My conclusion, therefore, is that the exclusive feature of this contract must be upheld." (Record, page 536.)

For convenience of comparison we have placed the terms of the Constitution and of the contract in each of the two cases referred to in parallel columns, as follows:

VICKSBURG CASE.

Constitution of Mississippi.

"Sec. 178. Corporations shall be formed under general laws only. The legislature shall have power to alter, amend or repeal any charter of incorporation now existing and revocable, and any that may hereafter be created, whenever, in its opinion, it may be for the public interest to do so; provided, however, that no injustice shall be done to the stockholders." 202 U. S., p. 464.

Terms of the Contract.

"1. That in consideration of the public benefit to be derived therefrom the exclusive right and privilege is hereby granted for the period of thirty years from the time that this ordinance takes effect, unto Samuel R. Bullock & Company, their associates, successors and assigns, of erecting, maintaining and operating a system of waterworks in accordance with the terms and provisions of this ordinance, etc." (185 U. S., p. 69; 202 U. S., p. 462.)

COLUMBUS CASE.

Constitution of Georgia.

"Art. 1, Sec. 3, Par. 2. No bill of attainder, *ex post facto* law, retroactive law, or law impairing the obligation of contracts, or making irrevocable grants of special privileges or immunities shall be passed.

"Par. 3. No grant of special privileges or immunities shall be revoked, except in such manner as to work no injustice to the corporators or creditors of the incorporation."

Terms of the Contract.

"14. The mayor and council are to grant a franchise for the exclusive privilege of maintaining and operating the works for a period of thirty years; or until such time as they may be purchased by the city; and during such time to rent from Thomas R. White the fifty double fire hydrants," etc.

This should be read in connection with Section 21 of the contract, as follows:

"21. The mayor and council reserve the right to the undisturbed use of the four

> inch water pipes, connections and attachments, now located on Broad, Randolph and Front streets, for fire purposes only, the supply of cisterns and engine practice. Said water pipe *not to be used for other water supply* or street sprinkling, after the completion of the waterworks, except with the consent of Thomas R. White." (Record. pp. 111, 113.)

2. The counsel for the City, however, seek to limit the effect of the exclusive feature of the contract. In their 11th assignment of error (Record, page 551), they claim that "the contract should have been so construed as conferring an exclusive privilege of supplying water to the City and its inhabitants from the source selected and by means of the system constructed, leaving the City free to adopt any other source of supply and such other means of distribution as should not infringe upon such special privilege."

It is submitted that this is a strained and unnatural construction of the language used. As far as "the system constructed" by White is concerned, the provision would be unnecessary. An owner of waterworks, like the owner of any other property, would have the exclusive privilege of using his own property until it was purchased from him without the need of a special provision in the contract.

Nor could this exclusive feature have been intended to protect White's right to any particular "source of supply." The subject of source is not mentioned, or hinted at. No

source had been selected at the time of the making of the contract, and it affirmatively appears from it that no particular source was in the mind of either of the parties. Even when a source should be selected, such selection was not made final; but the source must needs be changed whenever the water should be condemned by experts selected in the manner which the contract provides.

The case of *Stein vs. Bienville Water Supply Co.*, 141 U. S. 67, is not in point. In that case the City of Mobile owned a waterworks plant and a particular source of supply known as "Three Mile Creek." The City wishing to dispose of this property leased to Stein, by a written contract, its waterworks, including the source of supply, for a term of twenty years, and in the contract of lease granted him the "sole privilege of supplying the City of Mobile with water *from the Three Mile Creek* for twenty years from the date of this agreement." Afterwards, by Act of the Legislature of Alabama, this agreement was confirmed. This Court, construing the agreement in its entirety, held that it granted to Stein only the exclusive right to the source of supply which formed part of the property leased to him by the City, and did not grant generally the exclusive right of supplying the City with water during the term of the lease.

While the Court in that case states the rule that if, on a fair reading of the instrument, reasonable doubts arise as to its proper interpretation, those doubts are to be solved against the grant, it also lays down the important rule that "it is the duty of the courts not to defeat the intention of parties to a contract by a strained interpretation of the words employed by them." 141 U. S., *supra*, p. 80.

3. In its fifteenth assignment of error the City of Columbus contends "that the contract in question, in so far as it

may have granted an irrevocable special privilege or exclusive franchise, if any, contravened the provision of the Georgia Constitution forbidding the making of irrevocable grants of special privileges or immunities."

The twelfth assignment, which is directed to the same point, contends that, under the Constitution and laws of Georgia, the City is forbidden to make a contract granting an exclusive franchise or privilege for a term of years.

In discussing the *Vicksburg Case,* touching the contention that the above quoted provision of the Constitution of Mississippi forbade the irrevocable grant of exclusive franchises, this Court says:

"Furthermore, the Mississippi Constitution contains this provision, which is not in the Ohio constitution considered in the *Hamilton Case* [146 U. S. 258], namely, 'Provided [in exercising the right of amendment or repeal of a charter] no injustice shall be done to the stockholders.' If it be true that the complainant below had a binding contract excluding competition by the city in furnishing water for the period of thirty years, we think it would be a palpable injustice to the stockholders to permit the competition of the city by new works of its own, which, whether operated profitably for the municipality or not, might be destructive of all successful operation in furnishing water to consumers by the private company." *Vicksburg Case,* 202 U. S., *supra,* page 465.

What is thus said touching the provision in the Constitution of Mississippi is equally applicable to the provision in the Georgia constitution in the present case. Bondholders are certainly "creditors of the incorporation."

There is no provision in the Constitution or laws of Georgia which forbids the grant of exclusive franchises. An exclusive contract for water supply during a named period within the territory of a single city is not a "grant of a

special privilege or immunity" within the meaning of the Georgia constitution. But if it were such a grant, the Constitution does not forbid the grant of special privileges or immunities, but merely provides that when granted they shall not be irrevocable. The Constitution makes them revocable, but revocable only "in such manner as to work no injustice to the corporators or creditors of the incorporation." They can be revoked in the manner provided for the exercise of the right of eminent domain, namely, upon the payment of just compensation.

It cannot be said that the Constitution and laws of Mississippi permitted the grant of exclusive franchises in other sense than it can be said of Georgia and the other States of the Union. Nothing in the Constitution or laws of Mississippi is pointed to as permitting it. On the contrary, it was urged by counsel in the *Vicksburg Case,* that the laws of Mississippi did forbid the granting of exclusive franchises, and they cited decisions of the Supreme Court of Mississippi to support their contention.

These cases, other than the *Greenville Waterworks Case,* this Court distinguishes upon their facts, the franchises being different in character from an exclusive waterworks contract. In the *Greenville Case,* however, the Mississippi Court held that a city could not grant to a water company the exclusive right of supplying the city and its inhabitants with water for a series of years.

This Court says as to this:

"The Court held that there was no power given by the charter of the City of Greenville to grant a monopoly for a long series of years for supplying the city and its inhabitants with water. The question whether the city could exclude itself in such a contract as we have now before us was not met or passed upon. But if the doctrine of Mississippi

were otherwise, and with due respect to which the decisions of its highest Court are justly entitled, it has been frequently held in passing upon a question of contract, in circumstances such as exist in this case, involving the constitutional protection afforded by the Constitution of the United States, this Court determines the nature and character thereof for itself. *Douglas vs. Kentucky,* 168 U. S. 488. And we think the question of the power of the city to exclude itself from competition is controlled in this Court by the case of *Walla Walla vs. Walla Walla Water Company,* 172 U. S. 1."

Vicksburg Case, 202 U. S., *supra,* pages 466, 467.

Not only was this exclusive feature upheld in the *Vicksburg Case,* notwithstanding the Mississippi Court had held that under the law of Mississippi a city could not make such an exclusive grant, but the Court based its decision on the *Walla Walla Case,* where the city charter provided that no exclusive grant should be made.

In discussing this subject, this Court quotes the following passage from the opinion in the *Walla Walla Case* (172 U. S., p. 17):

"An agreement of this kind was a natural incident to the main purpose of the contract, to the power given to the city by its charter to provide a sufficient supply of water, and to grant the right to use the streets of the city for the purpose of laying water pipes to any persons or association of persons for a term not exceeding twenty-five years. In establishing a system of waterworks the company would necessarily incur a large expense in the construction of the power house and the laying of its pipes through the streets, and, as the life of the contract was limited to twenty-five years, it would naturally desire to protect itself from competition as far as possible, and would have a right to expect that at

least the city would not itself enter into such competition. * * *

"Cases are not infrequent where, under a general power to cause the streets of a city to be lighted or to furnish its inhabitants with a supply of water, without limitation as to time, it has been held that the city has no right to grant an exclusive franchise for a period of years; but these cases do not touch upon the question how far a city, in the exercise of an undoubted power to make a particular contract, can hedge it about with limitations designed to do little more than bind the city to carry out the contract in good faith, and with decent regard for the rights of the other party."

In conclusion, the Court says:

"We think that case is decisive of the present one on this proposition." *Vicksburg Case*, 202 U. S., *supra*, pp. 467, 468.

If the *Walla Walla Case* was decisive of the *Vicksburg Case* on this point, it should be decisive of the case at bar, where the exclusive feature of the contract is practically identical with that in the *Vicksburg Case*. No Georgia case is to be found which holds that a city in Georgia has not power under its charter to contract for the exclusive supply of water, still less that it cannot exclude itself during the life of the contract from entering into ruinous competition with the water company.

On the contrary, the decisions of the Supreme Court of Georgia distinctly and unqualifiedly hold that in Georgia municipal corporations possess this power. This will be seen by reference to the Georgia cases hereinbefore cited in Division I, page 6, particularly the *Dawson Waterworks Case* therein quoted.

The provision of the Georgia Constitution now in question refers obviously, we think, to corporate franchises and charter privileges, which, while constituting a contract between the State and the incorporators of a private corporation, according to the interpretation placed upon the word "contract," in the impairment of contract clause of the Constitution, by the Supreme Court in the *Dartmouth College Case,* yet partake "in no general sense of a bargain between the State and the corporations which they created," and are not within the class of ordinary contracts, in the usual sense in which that term is employed.

Such provisions are commonly met with in the constitutions of the several States, and are intended to do no more than reserve to the States the power of control over the charters of corporations formed by them, so as not to put such corporate charters beyond the State's right of amendment or control, under suitable safeguards. They were not intended to destroy the power of a State, or of municipal corporations, to enter into business contracts of a binding character, within the scope of the business or proprietary powers of the State or the municipality.

The use of the words "corporators" and "incorporation" in this section of the Georgia constitution seems to leave no room for doubt as to the character of the law "making irrevocable grants of special privileges or immunities" which the framers of the Constitution had in mind, even without regard to the history of statutory and constitutional reservations of this character.

Their history is clearly set forth in the opinions of Mr. Justice Miller in *Greenwood vs. Freight Co.,* 105 U. S. 13, and in *New Jersey vs. Yard,* 95 U. S. 104. This Court again reviews the subject in *Citizens' Savings Bank of Owensboro vs. Owensboro,* 173 U. S. 637.

As will be seen by comparison with similar provisions in the constitutions and statutes of other States, in the light of the history of their adoption, the above quoted section of the Georgia constitution is merely a reservation of the right to amend corporate charters so as to take them out of the operation of the decision in the *Dartmouth College Case*, 4 Wheat. 518.

Such being the obvious and well-known purpose of such provisions, it would be doing violence to the intention of their framers to extend them to the case of ordinary contracts between the State, or a municipal corporation of the State, in the exercise of its proprietary or business powers, and a person or corporation from whom the State or municipality purchased some article of necessity, or to provisions constituting safeguards without which the other party would not have been willing to embark upon the undertaking.

It is to be borne in mind that acts of incorporation, while possessing in a certain sense attributes of a contract, yet, perhaps more largely, possess all the attributes of general legislation. As stated by Mr. Justice Miller, it is frequently very difficult or perhaps impossible to draw the line which is to determine where legislation ends and contract begins.

The grants of "special privileges or immunities" referred to in the Georgia Constitution are therefore grants contained in acts of incorporation; "laws" in the common acceptation of the term, as distinguished from contracts in the common acceptation; "laws" relating to "incorporation," as distinguished from grants by contract which have no necessary connection with acts of incorporation, and therefore need no exception in favor of "the corporators or creditors of the incorporation."

It is true that the State, acting in its ordinary business or proprietary capacity in the making of a contract, or bargain,

in the popular acceptation of the term, may be said to pass a law. Every act of the Legislature, whether administrative, or legislative in the narrower sense, is a law. It cannot appropriate money except by law. It cannot contract for supplies for the State except by law. The same may be said of cities and towns.

A State, for instance, making a contract for the construction of a State house, legislates, and the contractor who obtains the contract obtains a "special privilege" not enjoyed by others. The law awarding him the contract at the price therein fixed may, therefore, in a sense, be said to be the grant of a "special privilege." But it would hardly be contended that it was the grant of a special privilege within the meaning of this section of the Georgia constitution; and that without cause, and while the contractor was carrying out his contract, and after he had incurred large expense in preparing plans and materials, which would be largely lost to him unless he could use them in its performance, the State could repudiate the contract, thereby causing the loss of the large investment made for the purpose of carrying it out; and that this would be nothing more than the revoking of a special privilege which, under the Constitution of Georgia of which all should take notice, the State would have the right to revoke; and that he therefore would have no right to complain.

In the same way it would seem clear that where a city contracts for water supply and sees fit to contract, not for a portion only, but for the entire water supply for the reasonable time limited in the contract, or, in other words, makes the contract exclusive for that time, by reason of the business necessity that it should be such, the contract does not fall within the operation of the above quoted section of the Constitution of the State.

The decision of this Court in the case of *Bienville Water Supply Co. vs. Mobile,* 186 U. S. 212, has, we submit, no application to the case at bar. The constitutional provision of Alabama, as well as the facts, were dissimilar. The waterworks franchise claimed in that case was a charter franchise beyond the life of the contract. The City of Mobile did not claim the right to supply itself with water except subsequently to the expiration of the contract with the Waterworks Company.

The provision in the Alabama Constitution (Article I, Section 23, quoted 186 U. S., *supra.*, page 215), differed from the provision in the Georgia Constitution in the important particular that the Alabama Constitution merely provides that no "law * * * making any irrevocable grants of special privileges or immunities shall be passed by the General Assembly;" without the qualification, found in the Georgia Constitution, that while not absolutely irrevocable, such grants shall be only revocable upon condition that the revocation shall work no injustice to the creditors of the incorporation.

The Bienville Water Supply Company claimed that after the expiration of its contract with the City of Mobile, on July 1, 1900, it still had the right to an exclusive franchise under its charter. The charter did not give it the exclusive right to supply the city with water, but gave it the right to acquire by purchase or condemnation what was known as the Stein franchise, being the exclusive right to a particular source of supply known as Three Mile Creek, and also gave it the exclusive right of supply from any other source.

By the Act of February 23, 1899, its charter was amended by striking out the word "exclusive," thus depriving it of the charter privilege of obtaining an exclusive franchise. This privilege it had never exercised, or sought to exercise during

the sixteen years the privilege had existed. The Constitution of Alabama, mentioned above, was in force, when the charter was granted.

The company having brought its bill, claiming that its charter constituted a contract whose obligation was impaired by the subsequent legislation, and the case having been carried to this Court on appeal, the Court said:

"The plaintiff took its charter with notice that it was not given the exclusive right of supplying the City of Mobile with water, and it had not, at the time of these transactions, obtained that which its charter before amendment purported to authorize it to obtain, to wit, an exclusive right to all the sources of supply in the county." 186 U. S., *supra,* page 218.

The Court accordingly held that the Legislature had the power of revocation and amendment.

It would seem to follow that if the City had a subsisting contract, entered into during the time that the franchise was exclusive, and were proposing to erect waterworks of its own, with a view of entering into competition with the water supply company, before the expiration of its contract, the exclusive franchise grant would have been held irrevocable, notwithstanding the express provision of the charter that nothing should be considered to prohibit the organization thereafter of any other company for the purpose of supplying the City of Mobile with water, and notwithstanding the provision of the Alabama constitution that such grants shall not be irrevocable. The grant that was held not to be irrevocable was the grant of a right to acquire an exclusive franchise not already acquired and of making exclusive contracts not already made. Up to the time that this was done no property right vested, and therefore the Legislature had the right to amend the charter. After a contract had been

entered into, no change in the charter could impair the exclusive feature of that contract. A franchise granted in a charter, until acted upon, does not acquire the quality of a contract. The right reserved by the Legislature to amend a charter gives no warrant for the proposition that a city having, in consideration of valuable benefits, entered into a stipulation that the plaintiff shall have certain rights or privileges involving great expense to it in complying with its obligation, can afterwards refuse to be bound by the stipulation. The city, when it enters into such a contract, merely stipulates that it will continue to be bound by the contract and will not take part of the right away and confer it upon another or exercise it itself after the contractor has incurred the expense necessary for its fulfillment.

"While the reserved power to alter or amend charters is subject to reasonable limitations, it includes any alteration or amendment which does not defeat or substantially impair the object of the grant or vested rights." *Berea College vs. Kentucky,* 211 U. S. 45.

4. Nor can such a case as this be held to be within the doctrine of the decisions relating to monopolies. In a recent case in the Eighth Circuit, where the Constitution of the State forbade "making any irrevocable grant of special privileges and immunities," which is substantially identical with the Georgia provision in question here, the Court held as follows:

"Municipal corporations have two classes of powers, the one governmental, in the exercise of which their officers may not bind the municipality beyond their terms of office, the other business or proprietary, in the exercise of which they are governed by the same rules as individuals or private corporations.

"A city exercises its business or proprietary power in purchasing waterworks or contracting for their construction or operation."

"A water works contract of an exclusive character does not constitute a 'special privilege or immunity' within the meaning of those words as used in the Constitution." *Omaha Water Co. vs. City of Omaha,* 147 Fed. 1.

And, speaking of the question of monopoly, Judge Sanborn says: "One who makes such a contract to grade a street, to construct a building, or to supply gas or water to a municipality may be said to acquire a monopoly of that work and a special privilege to perform it. But this special privilege or immunity is not granted to him by any law of the State. It is secured to him by his own agreement to render the public service." (147 Fed., *supra,* p. 7.) It will be noted that this decision and some others include a contract for the building of a street railway within the class of purposes which fall within the business or proprietary powers of a municipal corporation. It will be seen, however, from the authorities, that the power of a city to contract for the building of a street railway, is a far less usual and more doubtful power than the procuring of water supply. It requires a clearer grant from the Legislature, and when granted the grant is more narrowly and strictly construed, than is the case with respect to those more essential powers of a municipality such as the affording of fire protection, and water for the use of its inhabitants. For instance, a city in Georgia may exercise the power of taxation or issue bonds to supply water, but can not levy taxes, or borrow or expend money to build, or give aid to, a street railway.

A recent text writer states the doctrine thus:

"Exclusive privileges to supply water or gas are not considered monopolies according to the common law, because they

do not deprive a class of persons of privileges of which they had anterior to the time of granting been in possession." *McQuillin on Municipal Ordinances,* sec. 191, page 306.

In *Grant vs. Davenport,* 36 Iowa, 406, the Court, upholding the exclusive feature of a waterworks contract similar to the one at bar, says:

"It is further objected that the ordinance grants to the water company privileges and immunities which on the same terms can not be enjoyed by all citizens. The ordinance and its acceptance by the water company constitute a contract. It can hardly be good law to hold this contract invalid because the city can not make the same contract with every other citizen or company. Such a multiplicity of contracts might give the city too much water."

If a city has the right to provide a supply of water for itself and its inhabitants it has the right to provide the entire supply, unless its charter expressly limits it to the right of furnishing only a partial supply. And it would seem that the right of mutuality of contract—the right of the city to stipulate that both parties shall be bound, and not one only—the validity of a stipulation that the party who binds himself to furnish all of the article that shall be used, shall have the privilege of doing what he binds himself to do—are so clearly recognized and distinctly stated in the Walla Walla Case, that they could never again be called in question.

"It requires no argument or citation of authorities to sustain the proposition that if the city had the power to make the contract for its supply of water, it would not be void because of exclusiveness, for all contracts for service of this kind must, in their very nature, be exclusive." *Davenport Gas, etc., Co. vs. Davenport,* 124 Iowa, 32.

In *Citizens' Water Co. vs. Bridgeport Hydraulic Co.,* 55 Conn. 1, the Supreme Court of Connecticut deal with a con-

tract granting the exclusive right to supply a city with water. The following is an extract from the syllabus:

"By a clause in the charter of the defendant company the Legislature reserved the power to recall the franchise at its pleasure. Held, that this provision did not authorize the Legislature to set aside or impair the contract which the city had entered into for the exclusive use of its streets by the defendant company, so long as it should supply the city with water, and which the charter had recognized and confirmed."

In reply to the suggestion that the contract created a monopoly, the Court observed:

"Communities may endure monopolies but they can not endure the violation of contracts." (55 Conn., *supra*, 16.)

5. In this connection we may consider certain cases relied on by the counsel for the city as sustaining their view that the exclusive feature of the contract in this case cannot derogate from the power of the city to supply itself with water. They fall into two distinct classes.

A. Of the cases in the first class nearly all are cited in the opinion in the *Walla Walla Case* to make clear the distinction between (1st) the grant of franchises in the strict sense, and (2nd) those features of a contract made by a city, in the exercise of its business or proprietary powers, which are to be regarded as incidents of the principal undertaking, and "designed to do little more than bind the city to carry out the contract in good faith and with decent regard for the rights of the other party." Although, as stated by the Court, they "furnish little or no support to the proposition for which they are cited," namely, that the contract was "objectionable in its stipulation that the city would not erect waterworks of its own during the life of the contract," it may be useful to summarize their salient points.

Minturn vs. Larue, 23 Howard, 435, holds that the charter of Oakland, California, "which conferred upon the corporation power to regulate ferries, did not give an exclusive power, and therefore the corporation did not possess the power to confer upon others an exclusive privilege to establish them."

The town was not authorized to "establish" ferries, but to "regulate" them, and under this authority it undertook to grant the exclusive right to "establish" a ferry.

The Court says:

"If the Legislature had intended to confer their whole power upon this corporation to establish and regulate ferries within its limits, or a power to grant exclusive ferry rights therein, a very different form of grant would have been used."

The distinction between this ferry case, and a contract for water supply, where a city contracts that during a given period it will take its water exclusively from a party who would not be willing to go to the large expense of constructing and maintaining waterworks under a contract for partial supply only, is, we think, obvious.

The exclusive ferry franchise was a franchise, pure and simple; not an incident of a principal undertaking; not a buying something which the city had a right to buy, with a stipulation that the thing it purchased was to be of the entire quantity it should use. Water supply for a given period may be purchased as an entirety; the city need not contract for aliquot parts from different sellers, for the reason that it can be more economically and advantageously purchased in the former, than in the latter manner; just as a city can let a contract for building its city hall to a single contractor, and is not compelled to let it in parcels in order that it may not create a monopoly.

Wright vs. Nagle, 101 U. S. 791, is a toll-bridge case.

The Court construing certain statutes of the State of Georgia, held that the *proviso* in the Act of 1805, which reserved to the Legislature "the power of making such alterations in the establishments" (of bridges and ferries) "made by the justices of the inferior Courts as to them may seem proper" was not repealed by subsequent statutes, and that, therefore, an owner of a toll-bridge established by authority of the justices of the inferior Court had no such exclusive and irrevocable grant as to preclude the Legislature from subsequently authorizing the erection and maintenance of another bridge within the limits of the original grant.

Illinois Trust, etc. Bank vs. Arkansas, 76 Fed. 271, is cited by this Court in the *Walla Walla Case* (page 10), not upon the question of exclusive franchise, but upon the proposition that in the exercise of the power to contract for waterworks, a municipality is governed by the same rules as a private corporation.

In that case the Circuit Court conceded, for the purpose of the discussion, that the city had no power to make the privilege, in question there, exclusive. The same Court, when this question was directly presented to it, rendered the decision in the *Omaha Case* (147 Fed., *supra,* 6, 7).

Jackson County Horse R. Co. vs. Interstate Rapid Transit Ry. Co., 24 Fed. 307, is a street railway case. The city "was given by its charter general supervision and control of the streets, but was not given, in express terms, power to authorize street railways." The Court says:

"Under such power the city may permit any ordinary use of a street as a street. A street railroad comes within the ordinary scope of such use. But power to permit one citizen to use the streets in a given way is a very different thing from power to give such citizen the right to keep every other citi-

zen from a like use of the streets. The one is a mere street regulation—a license; the other rises into the dignity of a contract—a franchise." 24 Fed., *supra*, 308.

The case turns on the proposition that the city had no right to make a street railway contract. Cities in Georgia have the right to make waterworks contracts.

Saginaw Gas-Light Co. vs. City of Saginaw, 28 Fed 529, holds nothing more than that "the exclusive right to light a city with gas for thirty years is not legally 'impaired' by a subsequent contract with another company to light the streets with electricity."

The Court sums up its conclusion as follows:

"The plaintiff took nothing by its franchise but the privilege of lighting the streets with gas, and this it will continue to enjoy so far as its patrons prefer the use of gas to electricity. But its claim to the exclusive privilege of lighting the city by all methods of illumination can not be supported upon legal principles, and the injunction must therefore be denied." 28 Fed., *supra*, 540.

Grand Rapids E. L. & P. Co. vs. Grand Rapids Edison etc., Co., 33 Fed. 659, is to the same effect as the *Saginaw Case*, and the facts are similar.

Detroit Citizens' Street Railway Co. vs. Detroit Railway, 171 U. S. 48, merely holds that the common council of Detroit had no power, either inherently or derived from the Legislature, to grant to a street railway company in perpetuity the exclusive privilege of constructing and operating railways on and through the streets of that city.

The Court says:

"Any grant of power in general terms read literally can be construed to be unlimited, but it may, notwithstanding, receive limitation from its purpose—from the general purview

of the act which confers it. A municipality is a governmental agency—its functions are for the public good, and the powers given to it and to be exercised by it must be construed with reference to that good and to the distinctions which are recognized as important in the administration of public affairs." 171 U. S. *supra*, 55.

In view of this language it is pertinent to point out the manifest distinction between the classes of purposes of the exclusive grants dealt with by the Courts in the cases above cited, and the purpose of procuring municipal water supply—a purpose which in the nature of things would be defeated if it were not competent to stipulate that for a limited period the party furnishing this article of prime necessity shall have his investment protected against destruction by ruinous competition. Streets are regulated by cities as trustees for the general traveling public. Their use is primarily a public use belonging to the entire public in common. All grants to cities of the power of regulating the use of their streets must be interpreted in the light of the purpose for which the grant is conferred. On the other hand, water supply is one of the business or proprietary powers which a city exercises for the public as consumers, not for the public as furnishers of the water. It might as well be contended that in building a city hall any citizen has the right to do a portion of the work, as that in the matter of water supply any citizen has the right to furnish a portion of the supply. A city may, in Georgia, provide such water supply either by municipal ownership or by contract with a water company; and in either instance it may exercise this proprietary power as an entirety; in the latter instance delegating the whole proprietary right, since as pointed out in the *Walla Walla Case* two systems of waterworks, operating side by side in the same territory, duplicating each other in the original outlay for construction, the cost

of extensions, and the cost of operation, would inevitably prove ruinous to at least one of the systems.

B. The other class of cases includes those which do not call in question the power of a municipality to make a contract exclusive in its character, but which, construing particular contracts, hold that the language used does not indicate a purpose on the part of the contracting parties that the privilege of supplying water was intended to be exclusive. These cases would seem to have no direct bearing upon the question in this case.

In re Brooklyn, 143 N. Y. 596, interprets the contract under consideration in that case, as not being a contract for exclusive water supply. The Court points out that "there is nothing in the statute which either in terms or by apparent implication, grants to the corporation formed under it an exclusive right to supply the town or village with water; or which precludes other persons, if they can secure assent from the authorities to their application, from forming another company to supply water from other sources to the inhabitants of the same town or village." (Page 607.)

Conceding that the contract was with the town as a proprietor, and that the town possessed the proprietary right of furnishing water the Court looks to the language of the contract, in order to determine whether it is "to regard the grant by the town as one which makes it part with the whole proprietary right of purveying water within its limits."

Further discussing the contract, the Court says:

"We look in vain for an agreement binding the town authorities not to make a like grant or contract to or with others, if the public needs demand it. The contract is silent on all subjects except what the company may or must do." (Page 612.)

The remainder of the opinion deals with the question whether the State's power of eminent domain extends to waterworks property and franchises. The Court holds that it does, and that the city could exercise the power of taking over a waterworks property, including franchises and contract rights, under condemnation proceedings, upon the payment of just compensation. There is no such dispute in this case. The complainant is willing, as shown by its standing offer (Record, pp. 189, 524), that the City of Columbus may take over the waterworks property, upon paying just compensation therefor. But it denies that the city has the right to deprive it of its property without compensation and without due process of law. This case was affirmed in this Court in *Long Island Water Supply Co. vs. Brooklyn,* 166 U. S. 685.

Knoxville Water Company vs. Knoxville, 200 U. S. 22, is likewise a case which merely interprets the language used in that particular contract, without drawing in question the right of the city to have made the contract exclusive, had it seen fit to do so. For the purpose of the discussion the Court assumes, without deciding, "that the City of Knoxville was invested by the Legislature with full authority, or that under its general municipal powers it could bind itself by contract, to give to a single corporation or company the exclusive right for a specified period to supply water for the use of itself and its inhabitants." (Page 33.)

The Knoxville contract was not in terms exclusive. The city did not expressly grant to the water company the exclusive right to supply water during the life of the contract or for any other period; and did not agree that it would not itself erect and maintain waterworks on its own account. It was, however, sought to imply such a feature from the purpose of the contract, and the situation of the parties.

The construction placed by the majority of the Court upon the contract was in view of the words actually employed. If it was the purpose of the city to part with the right of establishing its own plant at any time in the future, such purpose cannot be gathered from the language of the contract alone and unaided. The contract is entirely silent upon this point, and its silence is the more noticeable, inasmuch as it does in terms provide that the city was "not to grant to any other person or corporation any contract or privilege to furnish water, etc." This excluding of competition by another water company, while omitting all reference to competition by the city itself, justifies the argument that the language of the contract was intentionally so restricted because of the city's unwillingness to part with the right of establishing a plant of its own.

Within the class now under discussion are to be included the following cases: *Skaneateles Water Co. vs. Skaneateles*, 184 U. S. 354; *Capital City Light, etc., Co. vs. Tallahassee*, 186 U. S. 401; *Joplin vs. Light Co.*, 191 U. S. 150; *Newburyport Water Co. vs. Newburyport*, 193 U. S. 561; *Helena Waterworks Co. vs. Helena*, 195 U. S. 383.

IV.

IN WHAT RESPECTS, IF ANY, HAS THE CONTRACT IN THIS CASE BEEN VIOLATED BY EITHER OF THE PARTIES THERETO.

1. *By the City of Columbus.*

As already stated in Division II of this brief (page 7), subsequent to the making of the contract in this case and after the rights of the complainant and the bondholders had been acquired, the Supreme Court of Georgia held that con-

tracts of this character constituted the creation of an indebtedness within the inhibition of the State Constitution. *Cartersville Imp. Co. vs. Cartersville,* 89 Ga. 683; *Cartersville Water Co. vs. Cartersville,* 89 Ga. 689; *City of Dawson vs. Dawson Water Works Company,* 106 Ga. 696.

The decision in the *Cartersville Case* was in August, 1892 The effect of this decision upon the attitude of the City of Columbus was soon apparent. After sundry proceedings in the City Council, beginning in March 1893 (Record, page 194), including a report from an engineer, pursuant to instructions, as to plans for municipal works, a resolution was adopted by the Council on September 10th, 1894, "that said contract of October 7, 1881, by and between the Mayor and Council of the City of Columbus and the said Thomas R. White, is hereby declared not to be legal and binding on the City of Columbus, and that if the said Columbus Water Works Company, the assignee of said contract, desires to furnish the City of Columbus with water it must come forward and make a new contract;" and, further, "that the said Columbus Water Works Company be and they are hereby notified that said contract shall be considered at an end by the City of Columbus, after January 1, 1895." (Record, page 208).

The then Mayor of the city, writing in remonstrance to a member of the Council, aptly stated that this action of the Council amounted to saying to the company: "We do not charge that the contract is broken by you, but we find a legal flaw in it, and therefore, taking advantage of that flaw, repudiate it." (Record, page 209.)

It is true that the City did not in this resolution refuse to pay for water furnished under the contract, nor is there any such refusal in the ordinance of September 14th, 1902, nor in the Act of the Legislature of Georgia of December 3, 1902,

which we contend is legislation subsequent to the contract and impairing its obligation.

But the foregoing resolution was in accord with a long course of action on the part of the City, which hampered the Waterworks Company in carrying out the contract on its part by injuring its credit and thus making it impossible for it to provide money for improvements or additions. No one, of course, would buy the bonds whose chief security was the contract with the City when the City persistently claimed that the contract had no legal validity.

Twice, before the ordinance of September 14, 1902, to wit, in 1894 and 1897, the City submitted to the voters the question of issuing bonds to build waterworks of its own, but the requisite number of voters failed to approve the proposition.

All the while the dealings with the Water Company on the part of the City and its representatives had been exacting and unreasonable. In December, 1894, for instance, the Council adopted resolutions (Record, page 213) making demands upon the Company of an extravagant character and insisting upon a supply and a service far in excess of the requirements of a city of the size of Columbus, while at the same time proposing, on the ground "that a restricted use of water is against public policy," that the use of water meters should not be continued and that the rates for water fixed by the contract should be much reduced. The Water Company throughout showed a willingness to comply with all reasonable demands of the City.

2. *By the Waterworks Company.*

A. On some three occasions during periods of extreme drought the water in the reservoirs became low, and as a result suffered in quality. The first of these occasions was in 1895. There was a lesser drought in 1898 and 1899, and in

1902 the severest drought occurred which had happened in that portion of the country. It seems to have been almost as unprecedented as the recent flood in the River Seine. The undisputed evidence shows that these recurring droughts affected all local streams in the vicinity of Columbus. (Record, pages 705, 1175.) Their increasing frequency and severity had made it necessary to go to the Chattahoochee River as the only sure and unfailing source of supply. The condition could not have been remedied by increasing the reservoir capacity; this would have only added to the stagnancy of the water and would have made conditions worse instead of better (Record, page 932). There were no other streams in the vicinity of Columbus that were not equally affected by this local drought, and the City was outside of the zone of artesian well supply (Record, page 267). There was but one remedy, and this the City was willing neither to recommend nor consent to, namely, to adopt the river as a supplementary source of supply.

Their own expert, Hall (Record, 298, 917), had recommended the river as a suitable source of supply, and in this he agrees with Boardman, the water engineer who testified for the plaintiff. (Record, 921, 923, 931, 946.)

The contract makes it incumbent upon the City, whenever it desires a change in the source of supply, or an improvement in the quality of the water, to make formal demand, give formal notice, and have the matter determined by experts, and, after such determination, the Water Company must adopt a new source of supply which will obviate the objections. Neither in 1895, nor in 1898, nor in 1899, nor in 1902, did the City call for a change in the source of supply, as provided in the contract.

During these very years the City was denying the obligations of its contract, and by its conduct had put the Water

Company in a situation where it could no longer market its bonds. Throughout this time the Water Company urged the City to acknowledge the validity of the contract and enable the Company to sell its bonds, agreeing that it would, if so permitted, make all changes and betterments that the City asked for and in excess of the requirements of the contract. The City's Waterworks Committee reported to the Council that the changes which the Water Company had agreed to make were in every way satisfactory. The Company only asked that the City should withdraw from its denial of the existence of the contract and from its refusal to acknowledge itself bound to take the water except from year to year during its pleasure. The City, however, continued to hold its hostile position.

Subsequent to the drought in 1899, the Company, at large expense, made improvements and extensions in the system, with the approval of the City and at its instance, by which the water was extended into the annex and the pressure was increased from the thirty-two pounds required by the contract to seventy-five pounds, and, at great increase of operating expenses, the system was converted from a gravity to a pumping system. After these changes no further droughts occurred until 1902, and the reports of the Mayor and Fire Chief speak in high terms of the quality of the water, the pressure, and the efficiency of the system (Record, pages 147-152). No further request was made either for change of source of supply or for increase of storage capacity.

The unfortunate condition in 1902 resulted from no fault of the Water Company. Nothing could have prevented it, except a change to the river as the source of supply, and this the City not only had not called for, but, as appears from the Record, opposed to the last. As soon as this condition arose, the bondholders came to the relief of the situation.

and, under their proceeding for foreclosure, caused nearly $50,000.00 to be raised by receiver's certificates, to which they consented that the lien of their bonds should be postponed. This was expended in giving to the City a modern filtration system of the most approved type. They followed this by an offer to the Court to make any other changes and improvements which the Court, after reference, might deem proper to bring the system up to the highest state of efficiency, without regard to the fact, as shown by the evidence, that in pressure, filtration, supply of water and other particulars the system was already better than the contract required.

B. The City, however, claimed in its cross-bill that the contract had been violated by the Water Company by reason of certain departures from the original specifications for the works. This cross-bill, filed more than twenty years subsequent to the completion of the works, ignores several important facts. These facts may be stated as follows:

(*a*) The City's acceptance of the completed system so modified, after thorough test and examination by experts employed for the purpose.

(*b*) That departure from the specifications gave greater elevation of reservoir, and consequently greater pressure, together with a water shed more securely removed from danger of contamination, and other compensating advantages.

(*c*) That the system so constructed met the requirements of the City for many years, and no request was ever made by the City that, in those particulars in which the system departed from the original plan, the substituted modifications should be discarded and the system brought into strict and literal conformity with the earlier specifications.

(*d*) That, as appears from the uncontradicted testimony of a waterworks engineer of wide experience, the discarded features would not have made the system any more efficient, or have tended to prevent or lessen the evils which subsequently arose from wholly disconnected causes. (Boardman, Record, pages 941, 961).

(*e*) That improvements involving the expenditure of many thousand dollars were made by the Water Company, and these present bonds, as well as the earlier issues, were purchased by innocent persons, while the City was year after year accepting the system and the service, not only without complaint but as eminently satisfactory, the reports of its Mayors, its Waterworks Committees and Fire Chiefs commending it in high terms.

(*f*) That at the time the cross-bill was filed, which asked for a forfeiture on this ground, the system had been so modified, on account of the necessities of the case, that the water was being partly drawn from the river and filtered by an expensive and thoroughly efficient filter plant, and neither of the departures from the original specifications had any longer any bearing upon the question of the suitableness of the system to meet the needs of the City or upon the character of the service afforded.

In this connection should be considered the above-mentioned offer by the plaintiff to make any betterments, enlargements, extensions and improvements which the Court should find to be needed.

The two chief departures from the original specifications of the contract were alleged to be:

(1) The substitution of a different style of filter from that mentioned in the contract. (Par. XI, Record, page 110.)

(2) The construction of storage reservoirs of 51,000,000 gallons capacity, instead of 125,000,000 gallons called for by one of the alternative provisions of the contract.

Allusion is also made to a third alleged departure, namely, thin edges to the water in the upper reservoir. As to this we need only say that the lower reservoir was the only reservoir which was constructed at the time the waterworks were accepted by the City; it is the only one to which the contract provision applies, and it is in everything but capacity above contract requirements. The upper reservoir was constructed several years later to serve as a settling basin. It was adapted to the purpose for which it was built; was built to meet the City's wishes, and was accepted by the City, whose Waterworks Committees in their reports referred in high terms of commendation to the excellent quality of water and increased efficiency thereby secured.

The filter, as to which this question is raised, was a crude affair, which would have been of no service except to remove solid particles in suspension in the water—a purpose which was much better effected by the upper reservoir or settling basin erected a few years later. Even for this minor purpose, of no importance, so far as the wholesomeness of the water was concerned, the filter would have been of no use except for a very limited time; for there was no means of cleaning it, and after it had caught all the detritus it was capable of holding it would have given off these small particles to the water which left it as fast as they were brought in by the water which entered it. The science of filtration was then in its infancy. This type of filter, and all other kinds then in use, attempted nothing more than mechanical filtration. The real impurities which are liable to produce sickness are soluble, and these were not removable by any system of filtration then in use. (Record, pp. 918, 924.)

The modification of the contract by which this filter was dispensed with, and another type of mechanical filter substituted for it, is found in the action preceding the resolution accepting the waterworks system as thus modified (Record, page 143). It is based upon a consideration, namely, the substituted filter, which the resolution immediately following accepts in lieu of the former type. The City was represented by experts of experience and skill at the time it reached its decision to assent to the change. The settling basin erected by the Water Company a few years later was an improvement on either the filter originally contemplated or on the substitute which was adopted. (Record, p. 961.)

The departure from the specifications of the contract in regard to reservoir capacity was more than offset by the advantages of greater elevation with greater pressure of water for fire protection, and of a location within a water shed in a thinly settled district, which provided in large measure against danger of contamination. The smaller reservoir offered the further advantage of a rock bottom, walled in with rock walls, a feature not called for by the contract, and which would have been impracticable had a reservoir of 125,000,000 gallons capacity been insisted on instead of this smaller reservoir of 19,000,000 gallons.

This modification was doubtless accepted by the City by reason of these compensating advantages. It will be seen from the contract as a whole that this large storage reservoir was not regarded as an essential feature. In contrast with the definiteness which is noticeable in other features of the contract, the contract in regard to supply and storage gives to White and his successors a choice of three methods—*first*, a storage reservoir with an available capacity of not less than 125,000,000 gallons of water when filled (Paragraph III, Record, page 109); or *second*, if this was found "impracti-

cable, either owing to natural causes, objections or unreasonable rights of landowners," then a secondary or distributing reservoir of not less than 3,000,000 gallons capacity might be used (Paragraph XLV); or, *lastly*, if deemed expedient, he might adopt what is known as the Holly system, with a storage reservoir of not less than 50,000,000 gallons capacity (Paragraph XLVIII).

At the time the contract was formulated the source of supply had not been decided upon; and the feature of storage capacity was, therefore, regarded as only so far important that 3,000,000 or 50,000,000 or 125,000,000 gallons capacity would be deemed desirable according as one method of distribution or another might render a larger or smaller reservoir feasible or desirable.

This seems to have been the contemporaneous construction placed upon the contract by the parties. It is inconceivable that the City, represented as it was by engineering experts of ability, would have stipulated for a reservoir capacity of 125,000,000 gallons, and have failed to ascertain that 19,000,000 gallons fell short of 125,000,000. Even without the aid of experts, the City authorities would be in law chargeable with knowledge of the difference between gallons and pints. The acceptance of the 19,000,000-gallon reservoir becomes, however, perfectly intelligible when it is borne in mind that the purpose of this large reservoir capacity was to secure a sustained pressure equal to that due to an elevation of 100 feet, and the additional elevation of 19 feet gave such a wide margin that the large surface of a 125,000,000-gallon reservoir was no longer of any importance. At all events, the contract makes it clear that the reservoir capacity of 125,000,000 gallons was not regarded as a fixed requirement of the contract. It was, like all the specifications of every contract, subject to modification at the will of the parties.

The system was not only accepted as satisfactory, but for years the service was all that could be desired. Nor did the City ever ask for any increase of reservoir capacity.

In 1887 the upper reservoir was built, giving an elevation of 146 feet, nearly fifty per cent. greater than that called for by the contract, and increasing the reservoir capacity to about 51,000,000 gallons, or nearly three times as great as it was when the system was accepted by the City. This upper reservoir was built to serve as a settling basin, and also to give an improvement in the pressure through the increase of elevation. At the same time, a standpipe, a feature not called for by the contract, was also erected at considerable cost, thus still further improving the pressure. Later, other improvements, particularly the erection of the Rose Hill standpipe, and the substitution of a pumping system for the gravity system, gave a pressure of 75 or 80 pounds, in the lower part of the city, instead of the 32 pounds called for by the contract. These improvements cost the Water Company many thousand dollars, besides largely increasing operating expenses.

This change from a gravity system to a system supplying pressure by pumping machinery and standpipes eliminated the feature of the contract which required a reservoir of 125,000,000 gallon capacity, in case gravity pressure was relied on. For, as has been seen, the contract provides in terms that if instead of gravity a system of supplying pressure by pumps should be adopted, a reservoir of 3,000,000-gallon capacity only should be required, and that only for distributing purposes (paragraph XLV), the storage reservoir being only required in order to make the pressure stable and sure, if the gravity system should be adopted.

It may be added that according to the uncontradicted testimony of Boardman (Rec., pp. 932, 940), an increased reser-

voir capacity would not have increased the efficiency of the system from other standpoints than that of fire pressure, even at those two or three seasons of extreme drought when the water in the upper reservoir became low. For domestic purposes, a larger reservoir would at those seasons have made conditions worse. A certain proportion must exist between the size of the reservoir and the size of the stream running into it. When through extreme drought the stream running into a reservoir becomes unwontedly small, the water in the reservoir, if of large volume as compared to the shrunken stream, stagnates.

The requirements of the contract should not be confused with what may be deemed the requirements of an ideal system of waterworks. The service as a whole, both as to pressure and quality of the water, has, with few exceptions, been good, and fully up to contract requirements. The failures have not been more numerous than in other cities, despite the difficulties met with.

It was also urged by the City that it should be released from its contract because the sizes of the pipes used in the distribution system were too small and because the system, as it is claimed, is thereby less efficient. The sizes used are those fixed by the contract. This not only fixes generally the sizes to be used, but provides that they shall be laid under the supervision of a special committee appointed by the City Council and in accordance with maps which were on file at the time the contract was entered into, and which served as specifications of sizes, location and distribution. The pipes were laid in accordance with these specifications, and under the supervision of the City's special committee, and were accepted when the entire system, of which they formed a part, was accepted by the City.

It is not contended that in a single instance a smaller pipe was used than that called for by the specifications forming part of the contract. The contract contains a provision fixing the circumstances under which pipes originally sufficient, which subsequently came to be too small on account of increased water consumption, should be taken up and larger pipes substituted. It is not contended that these circumstances ever arose, or that larger pipes were called for under this provision.

The contract provides that the City is to determine the sizes of pipe to be used in extensions made from time to time, the Water Company being allowed by the contract a larger revenue wherever the City selected larger sizes. All of the small sizes that were used in the extension were used because the City chose the smaller sizes in order to get the benefit of the cheaper cost of water. It appears, however, that from the time that the present bondholders purchased their bonds in 1891, up to the present time, only the larger sizes of pipes were used in extensions.

We submit, however, that this whole question is settled by the acceptance by the City of the modifications of the contract. It is unquestioned law that acceptance, express or tacit, or acquiescence, after a reasonable opportunity to ascertain modifications, departures from original plan, or actual defects, waives all right of objection to such modifications, departures or defects. It becomes a conclusive presumption that the party accepting agreed to the modification, or did not regard the defect as material.

On this matter the Circuit Court expresses its conclusion, as follows:

"It seems to me, under the facts as shown by the evidence, that when the City Council was informed that the waterworks system had been completed, and the Council with the

aid of experts, examined the system and expressed its satisfaction and approval, it could not afterwards set up defects in the original construction of the system." (Record, page 537.)

A municipal corporation cannot, any more than a private corporation or an individual, take shelter under the plea of ignorance, or escape those obligations which the law raises from conduct, or the operation of the doctrines of notice from opportunity to know, of waiver, of acquiescence, of estoppel, of acceptance, of presumed novation, of implied contracts, and of the manifold applications of the principle that public corporations no less than individuals are held to the strictest good faith in their dealings with others, and the exercise of due diligence in all matters pertaining to their business or proprietary powers. *San Francisco Gas Co. vs. City of San Francisco* (Opinion by Mr. Justice Field), 9 Cal. 453-475; *Allegheny City vs. McClurkan*, 14 Penn. 81; *Neosho City Water Co. vs. City of Neosho*, 136 Mo. 498; *Creston Waterworks Co. vs. City of Creston*, 101 Iowa, 687, *Ludington Water Supply Co. vs. City of Ludington*, 119 Michigan, 480; *Joplin Waterworks Co. vs. City of Joplin*, 76 Southwestern Rep. 969.

It is familiar learning that acceptance waives known or discoverable defects, and acceptance of something different from what the contract calls for varies *pro tanto* the original contract.

These familiar principles are applicable in their fulness to municipal waterworks contracts, as will be seen from several of the foregoing cases.

And particularly is this true where innocent creditors or bondholders have acted upon the faith of such acceptance.

"Where a contract with a city requires a plant furnished by a water company to supply a certain quantity of water

and force for its fire department, subject to acceptance by the city, after acceptance the capacity of the plant as accepted. and not that called for by the original contract, is the measure of the amount of water and force the company must furnish." *Owensboro Water Co. vs. Duncan,* 32 Southwestern Reporter, 478.

"In its cross-bill the city has made claim for damages, and insisted that the waterworks system does not come up, in efficiency and completeness, to the requirements of the contract. We agree with the Circuit Court, after reviewing carefully the testimony, that the city is not entitled to maintain this claim. It has for many years recognized and accepted this waterworks system as having been constructed in full compliance with the demands of the contract, and it is now too late to repudiate such recognition." Opinion of Mr. Justice Brewer, in *National Waterworks Co. vs. Kansas City,* 62 Fed. 853, 866.

In *Illinois Trust and Savings Bank vs. Arkansas City,* 76 Fed. 271, the Circuit Court of Appeals for the Eighth Circuit deals with the subject of the effect of acceptance, particularly in its relation to the rights of bondholders who loaned money on a mortgage on the plant and income of the waterworks in reliance upon such acceptance.

We quote from the opinion of the Court:

"The last consideration alone ought to be conclusive of this question. These parties construed this contract themselves before any controversy arose over it. One party constructed, and the other accepted, under the contract, pipes and hydrants, which could not stand the test of section 9 of the ordinance. They thereby themselves held that such test had no relevancy to the extended pipes and additional hydrants. and their view was undoubtedly right. In an executory contract, and where its execution necessarily involves a practical

construction, if the minds of both parties concur, there can be no great danger in the adoption of it by the Court as the true one." * * *

"There is another and a conclusive reason why this city cannot maintain any of the defenses it has interposed in this suit. It is that it cannot accept the benefits and repudiate the burdens of its contract. It is that it cannot be heard to deny the truth of the representations of the existence and of the execution of this contract, which its records and its conduct have constantly made, and in reliance upon which, the Gas Company and the Water Company constructed and extended the waterworks, and the bank and the bondholders loaned their money. No principle is more universal in the jurisprudence of civilized nations, no principle is more equitable in itself, or more salutary in its effects, than that no one may, to the damage of another, deny the truth of statements and representations by which he has purposely or carelessly induced that other to change his situation. This principle is equitable because it forbids the untruthful or culpably negligent deceiver from profiting by his own wrong, at the expense of the innocent purchaser or contractor who believed him. It is salutary, because it represses falsehood and fraud. * * * This principle is as applicable to the transactions of corporations as to those of individuals. As Mr. Justice Campbell well said in *Zabriskie vs. Railroad Co.*, 23 How. 381, 400, 401, in which the Supreme Court held that a corporation was estopped to question the validity of its void guaranty, because it had permitted the circulation of the bonds that carried it: 'A corporation, quite as much as an individual, is held to a careful adherence to truth in their dealings with mankind, and cannot, by their representations or silence, involve others in onerous engagements, and then defeat the calculations and claims their own conduct had superinduced.'" 76 Fed., *supra*, 292-294.

See also *Beadles vs. Smyser*, 209 U. S. 403, where it is said that "the principles of natural justice and fair dealing are alike applicable to municipal corporations as to individuals."

V.

HOW FAR THE POLICE POWER OF A MUNICIPALITY CAN BE INVOKED TO MODIFY OR ABROGATE ITS CONTRACTUAL OBLIGATIONS.

In the seventh assignment of error (Record, page 550) the City of Columbus contends "that in abrogating its contract with said Waterworks Company and providing for the construction of its own system, the City acted in the exercise of its police power and in due execution of the municipal trust committed to it."

The recital in the preamble to the ordinance of September 14, 1902 (Record, page 37), that "the Columbus Waterworks Company has totally failed to supply the City of Columbus and its inhabitants with a sufficient quantity of pure and wholesome water," and that "the public health of the City of Columbus is paramount in importance to every other consideration; and the owning by the City of Columbus of her own waterworks would result in a great saving in the cost of fire protection, sanitation and other purposes," cannot give to the ordinance the character of an exercise of the police power.

An examination of the ordinance will show, we think, that the recitals making up the preamble were meant chiefly as an address to the voters. In the Act of the General Assembly of December 3, 1902, there is no such recital. The preamble, however, does not change in any way the character

of the ordinance, so far as it affects the right of the party whose contract it impairs.

The police power of a State is subordinate to the Constitution; it cannot "contravene the Constitution of the United States or infringe any right granted or secured by that instrument." *Jacobson vs. Massachusetts,* 197 U. S. 25.

It would not be subordinate to the Constitution, but would itself be the supreme law, if the mere assertion by a municipality, in an ordinance, that it was proceeding to exercise police power could divest contract rights.

An examination of the contract will show that a case could hardly arise for which it does not make adequate provision without a resort to police power on the part of the City. The subjects of insufficiency of quantity or of pressure; of interruption of supply; of the need of extension and enlargements; of contaminated or unwholesome water; of change of source of supply; of purchase by the City, and all other questions liable to arise, are minutely dealt with in the contract itself. Had the City been content to act under the contract, and comply with its obligations, there would have been no need of ordinances or Acts of the Legislature to enable it to have waterworks of its own.

To hold that a city's police power absolves it from a compliance with those provisions of the contract which were intended to furnish some safeguard against capricious action, while affording to the city the fullest measure of protection, would be carrying the doctrine of police power further than it has yet been carried.

If the contract had made no provision for insuring the abundance and wholesomeness of the water supply, the City could, in the exercise of its police power, have taken proceedings in the Courts to compel the Water Company to furnish a proper quality and quantity of water. If the con-

tract had made no provision for purchase, and the acquisition of the works should have become essential to further some design for the health of the City, it would have been a proper exercise of the police power to acquire them by condemnation. But the police power cannot be invoked to sustain a course of action by a city which is in violation or disregard of a contract made by it for the health and safety of its inhabitants, and containing proper provision therefor; particularly when such a course would result in the practical confiscation of the property of the other party.

The doctrine as to waterworks is stated by this Court as follows:

"Where a contract for a supply of water is innocuous in itself and is carried out with due regard to the good order of the city and the health of its inhabitants, the aid of the police power cannot be invoked to abrogate or impair it." *Walla Walla Case,* 172 U. S. 17.

A recent text writer, treating of the general doctrine, states that the trend of the decisions is against the restraint of the exercise of the right of contract; that "the judges have almost uniformly decided against the exercise of the police power to trammel individual rights of contract;" and that "where property is taken in that way for the public health and safety, in general it cannot be taken without compensation, and there is no distinction between the power of eminent domain and the police power in this regard." *Russell's Police Power of the State,* 53, 54, 66, 71, 86.

The following are extracts from some of the later cases on this subject:

"The question whether an ordinance is a fair, reasonable and appropriate exercise of the police power, or is an unreasonable, arbitrary interference with the right to hold and enjoy property under the guise of an exercise of police power,

is a judicial one, and the Courts are not precluded from determining it by the mere fact that a municipal body has expressed its judgment." *Hume vs. Laurel Hill Cemetery et al.*, 142 Fed. 552.

"While a local regulation, even if based on the acknowledged police power of a State, must always yield in case of conflict with the exercise by the general Government of any power it possesses under the Constitution, the mode or manner of exercising its police power is wholly within the discreton of the State, so long as the Constitution of the United States is not contravened, or any right granted or secured thereby is not infringed, or not exercised in such an arbitrary and oppressive manner as to justify the interference of the Courts to prevent wrong and oppression." *Jacobson vs. Massachusetts, supra,* 197 U. S. 11.

"Courts may look through and behind mere forms, and interfere, whenever necessary, for the protection of private rights against an illegal, arbitrary exercise of governmental power." *West Chicago Street R. R. Co. vs. Chicago,* 201 U. S. 506.

"The inhibitions of the Constitution of the United States upon the impairment of the obligation of contracts, or the deprivation of property without due process, or of the equal protection of the laws, by the States, are not violated by the legitimate exercise of legislative power in securing the public safety, health and morals. The governmental power of self-protection cannot be contracted away, nor can the exercise of rights granted, nor the use of property, be withdrawn, from the implied liability to governmental regulations in particulars essential to the preservation of the community from injury." *N. Y. & N. E. R. R. Co. vs. Bristol,* 151 U. S. 567, quoted in *Northern Pacific Railway vs. Duluth,* 208 U. S. 583, 596.

See also, to the same effect, *C., B. & Q. Ry. vs. Drainage Commrs.*, 200 U. S. 561; *St. Paul, Minneapolis, &c., Ry. vs. Minnesota*, 214 U. S. 497.

There is a clear distinction between the class of cases of which the five last cited are examples and the case at bar. They are cases relating to the control of the State over its highways and navigable waters; the contracts in question in them were, in the nature of the case, subject to the paramount governmental power. In this case, the contract was an exercise of the business or proprietary power of the City with a view to enable it to carry out, in the method selected by itself, its power to provide for the health and security of its inhabitants. As already pointed out, the contract makes full provision for the protection of the rights of the City; it is only after it has tried without success to enforce its rights under the contract that it can fall back upon the police power.

The two cases which follow, relating, respectively, to the regulation by governmental power of miners' wages and of the height of buildings, do not qualify the distinction above set forth. On the contrary, they repeat, as has been held often before, that the Courts will protect against an attempted exercise of the police power which is oppressive, or which is "arbitrary, unreasonable and beyond the necessities of the case."

"The police power of the State is not unlimited, and is subject to judicial review, and laws arbitrarily and oppressively exercising it may be annulled as violative of constitutional rights."

"The legislature of a State is primarily the judge of the necessity of exercising the police power, and Courts will only interfere in case the act exceeds legislative authority; the fact that the Court doubts its wisdom or propriety affords no

ground for declaring a State law unconstitutional or invalid." *McLean vs. Arkansas,* 211 U. S. 539.

Police power cannot be exercised "unless it has some fair tendency to accomplish, or aid in the accomplishment of, some purpose for which that power can be used; * * * if the statute is arbitrary, unreasonable and beyond the necessities of the case, it is invalid as taking property without due process of law." *Welch vs. Swasey et al.,* 214 U. S. 91.

VI.

THE POWER OF A COURT OF EQUITY TO SO MOULD ITS DECREE AS TO GRANT RELIEF UPON SUCH TERMS AS IN ITS JUDGMENT SATISFY THE EQUITIES OF THE PARTICULAR CASE.

It is hoped that the equities of the bondholders, on whose behalf the plaintiff sues, have been somewhat disclosed in the course of the foregoing argument. It may be permitted to summarize them.

When the City of Columbus elected to provide waterworks by contract instead of erecting waterworks of its own, it was aware that the money necessary would be, to a large extent, provided by the issue of bonds by the contractor. This is clear from Paragraph XV of the contract (Record, p. 111), where the City agrees to receive in payment for any taxes due to it "the due coupons of any bond issued by Thomas R. White to an amount not exceeding the rental due by the City to him in any one year, etc." The $100,000 of bonds first issued were afterwards retired by the second issue of $150,000 bonds, which in turn were retired by the issue of the bonds whose holders are seeking to protect their interests in this suit. All these bondholders had a right to rely upon this recognition by the City that its contract had fixed relations

with the coupons on their bonds. The present bondholders did in fact rely upon the provisions of the contract (Record, pp. 173, 174 and testimony of Colston, p. 1120).

In case the City should at some future time deem it best that it should own and operate waterworks for itself, they had the right to rely upon paragraph XLII of the contract (Record, p. 117) that the works built with their money would be purchased at a fair valuation to be fixed by arbitration, and on the provision in paragraph XV (p. 111) that the exclusive privilege of maintaining and operating the works should be "for a period of thirty years or until such time as they may be purchased by the City." They did in fact rely upon this provision (Record, p. 1119). The City was under no obligation to purchase at any fixed time, but the implication is clear from these provisions of the contract, and the principles of justice and fair dealing require, that if it should desire municipal ownership, it would purchase these works rather than duplicate them. It is hard to conceive of any reason why the City should not have followed the course laid down in the contract except that its authorities supposed that the hostile course which they have pursued might bring about a sale of the present works at less than their real value. It is not unlikely that their minds, and the minds of the citizens, were somewhat influenced in this direction by the owners of other sources of supply. The sources of supply from Blue Springs, Roaring Creek, Standing Boy Creek and elsewhere, are much dwelt upon in the testimony. (Record, pp. 270, 287, 788, 805, 916, 989). All of these except, perhaps, Blue Springs, are subject to the same droughts which have affected the Alabama reservoirs now in use, and Blue Springs, as shown by the testimony (Record, p. 816), is so distant that it would cost more than the total cost of the present works to bring water from it to the City boundary.

It is not contended that any notice was ever given to the bondholders, or to their trustee, of any complaints of the City against the water company. The company never defaulted on its interest. At the critical period in 1902, as has been shown above (Division IV. 2. p. 38), when the excessive drought, in connection with the attitude of the City, brought about a situation which the waterworks company could not deal with, the bondholders intervened and spent large sums to give the City all that it could reasonably demand, and in the seven years that have followed they have continued to do so. Neither the waterworks company since 1894, when it was notified by the City that it considered itself no longer bound by the contract, nor the bondholders during this long litigation, have sought to evade or lay down the burden which they had assumed. They have done their best and have fairly succeeded in giving the City an adequate supply of good water.

The following are extracts from the opinion of the Circuit Court upon this branch of the case (Record, pp. 539-541):

"The prayer of the cross-bill filed by the City is that it have a decree annulling the contract with the Water Works Company, and that the cross-defendants be perpetually enjoined from setting up any right or interest thereunder. This would be in effect decreeing a forfeiture of the Water Works Company's rights under its charter and under the ordinances of the City, and under its contract. This will not be done in a Court of equity, and certainly not except upon the same conditions that the prayer of the complainants in the original bill for an injunction will be denied. It should not be done unconditionally in any event, and clearly not as against the bondholders. * * *

"At the time the report of the master was filed the receiver had expended $47,220.85 in improvement of the plant, the

larger part of which was for a filter plant and pumping station [see Record, p. 571]. Since that time the receiver has expended a considerable additional amount in improvements. From the time he took charge the receiver has, with one exception, been furnishing the City with fairly good water and with a sufficient supply of the same. The exception was in the summer of 1904, during a protracted drought, when the streams in Alabama were almost dried up and the Chattahoochee River very low. The main difficulty was that the intake was at a point below where there was some contamination of the river. This was promptly remedied, and since that time there has been no complaint, at least none has been brought to the attention of the Court.

"The bondholders, acting through their committee, have done everything reasonably within their power to make the present waterworks system effective and satisfactory. I am not satisfied that under the facts of this case it is brought within the ruling of the Supreme Court in *Farmers Loan & Trust Co. vs. The City of Galesburg,* 133 U. S. 156. In that case it was held that the rights of the bondholders were no higher than those of the company, the decision being based, of course, on the facts of that case. In this case the City has for five years accepted and received the benefits of the efforts of the bondholders to give the City a good supply of water. While, of course, the bondholders were interested in protecting their security, the result of the work and improvements, for which they furnished the funds, has been to give the City what is conceded, I think, by all parties to be at least a fairly good supply and quality of water. They must continue to do this until the end of this litigation, whenever that may be, for the idea could never be entertained of allowing the waterworks to be stopped and the City left practically without water, as it would be now unless this system was continued. The maxim 'He who seeks equity must do equity' is applicable

here. I conclude that not only in justice and fairness, but testing the matter by sound principles of equity, the City, as against these bondholders, should be required to take so much of this waterworks plant as may be hereafter determined, at a fair valuation, as a condition of, and before entering a decree in its favor finally denying an injunction in the case against the issuance by the City of its waterworks bonds."

The Circuit Court then discusses the purchase clause of the contract (Par. XLII, Record, p. 117) and continues as follows:

"In my opinion this provision of the contract adds to the duty of the City to take this waterworks plant at a fair valuation, as it was clearly in the minds of the parties, the City and White, the assignor of the Columbus Water Works Company, that if the City should desire to establish municipal ownership it might take this plant at a fair valuation. It adds something at least, to my mind, to the equities of the bondholders in the present situation. * * *

"There is no reason whatever why the present water works plant, or certainly the greater part of it, cannot be utilized in connection with any new source of supply that may be resorted to by the City."

The equitable character of an option to purchase in a contract of this kind has been distinctly recognized.

In *Indianapolis vs. Consumers' Gas Trust Co.,* 144 Fed. 640, the Court, in discussing a provision in a grant of franchise to a gas company that the city should have the right after a fixed period to purchase the company's plant and property at an appraised valuation, said:

"The provision for purchasing the corporate property, when it is no longer available to the corporation for serving the public and cannot be made available without renewal of the City franchise, we believe to be incidental only to the pur-

pose of limiting the grant—as an equitable arrangement to save the grantee from sacrifice of the property thus made useless by the expiration of the license and to preserve it for future public use." (144 Fed., *supra*, 645.)

Grosscup, J., concurring, said:

"In exacting this option the City lawfully represented the public will, just as much so, as under other given circumstances, the standing legal rule against voluntary surrender represents the public will." (Page 649.)

The following are cases where a similar option to purchase was upheld in favor of the City as against the water company:

City of Fayetteville vs. Fayetteville Water L. & P. Co., 135 Fed. 400; *Castle Creek Water Co. vs. City of Aspen*, 146 Fed. 8; *Bristol vs. Bristol &c. Waterworks*, 19 R. I. 413; *Braintree Water Supply Co. vs. Braintree*, 146 Mass. 482.

And in *Cherryvale Water Co. vs. Cherryvale*, 65 Kan. 219, the city was held to the execution of such an option which had been exercised, although meanwhile the lake which was the source of supply had gone dry.

From another point of view the equities of the bondholders are apparent. The forfeiture of the contract which is sought by the City in its cross-bill would release the waterworks company and the bondholders from their obligation to furnish water, at the same time that it released the City from its obligation to take it. The effect of such contention, if the waterworks company were to take the City at its word, would leave the City of Columbus entirely without water for fire protection, for drinking purposes, for domestic or industrial use.

As this Court said, adopting the language of the Supreme Court of California, of a contention in a similar case:

"It is difficult to imagine how this ordinance was passed seriously; for if the water company had been prevented from

taking from the river at that time more than ten inches of water under a four-inch pressure, there certainly would have been a water famine in the city, for the city had no works of its own and no means whatever for supplying water for either domestic or municipal purposes." *Los Angeles vs. Los Angeles City Water Company,* 177 U. S. 558, 583.

It needs no argument to sustain the decision of the Circuit Court that this case is not within the ruling of this Court in the *Galesburg Case,* 133 U. S. 156. In that case, from the time of the completion of the works to the date of hostile action by the City, the water furnished by the company was unfit for domestic use, and within a year from the completion of the works it proved inadequate for fire protection. The action of the City repealing the ordinance granting the franchise was within eighteen months from the completion of the works. The company "failed to comply with its contract and acknowledged that failure" (p. 171). It defaulted on its interest four months before the hostile action by the City, but the bondholders failed to take possession as they had the right to do under their mortgage and "during such possession to make all needful repairs and replacements in the mortgaged property" (p. 173). "The course of the City was entirely forbearing and generous towards the water company" (p. 176). It is manifest that in every particular on which legal rights could be grounded, the *Galesburg Case* differs from the case at bar.

The general rule governing Courts of equity in such cases is well stated in an early case in this Court, as follows:

"A Court of equity cannot act upon a case which is not fairly made by the bill and answer. But it is not necessary that these should point out, in detail, the means which the Court shall adopt in giving relief. Under the general prayer for relief, the Court will often extend relief beyond the spe-

cific prayer, and not exactly in accordance with it. Where a case for relief is made in the bill, it may be given by imposing conditions on the complainant consistently with the rules of equity, in the discretion of the Court."

Walden vs. Bodley, 14 Peters, 164.

In a later case it was reiterated in the following language:

"The complainant being entitled to relief, the next question is, on what terms? For as they ask the active aid of the Court to coerce performance of the respondent's contracts, they can only have such aid on the terms that they do him equity. A rule without an exception, within our recollection."

Buchannon vs. Upshaw, 1 Howard, 56, 84.

Some illustrations of the application of the rule follow:

In *Fosdick vs. Schall,* 99 U. S. 235, the Court said:

"The mortgagee has his strict rights which he may enforce in the ordinary way. If he asks no favors he need grant none. But if he calls upon a Court of chancery to put forth its extraordinary powers and grant him purely equitable relief, he may with propriety be required to submit to the operation of a rule which applies in such cases, and do equity in order to get equity."

See also, to same effect—

Kneeland vs. American Loan, etc., Co., 136 U. S. 89.

Thomas vs. Brownville, etc., R. R. Co., 109 U. S. 522, was a suit to foreclose a railroad mortgage. The stockholders intervened and successfully attacked the validity of the mortgage on the ground of fraud. The trustee appealed to this Court for reversal so far as to permit him to recover the sum

actually earned by the construction company which had received the bonds secured by the mortgage, and this appeal was sustained. Mr. Justice Miller, delivering the opinion of the Court, said:

"These stockholders had no legal right to interfere. It was only by permission of the Court that they were allowed to come in and contest the validity of the mortgage. In doing this they became actors. They filed their cross-bill. In this condition of the case they are amenable to the rule that they who seek equity must do equity. It is just that they should pay a fair price for what they have received; that this mortgage, given for the construction of the road, though excessive by reason of the fraud in the contract, should stand for the reasonable value of what the company actually received in the way of construction. To permit these intervenors to defeat the mortgage on any other terms would be unjust and would make the Court the instrument of this injustice" (p. 527).

So in *Bourke vs. Hefter,* 202 Ill. 321 (19 L. R. A., new series, 1075), it was held that where a bill to foreclose a trust deed and a cross-bill praying for its cancellation made a case cognizable in equity, the Court, though finding that the party liable on the notes which the trust deed purported to secure was not bound by such trust deed, had power to enter a personal judgment for the amount found due on the notes, and to require its payment as a condition to setting aside the trust deed.

In *Lockhart vs. Leeds,* 195 U. S. 437, Mr. Justice Peckham said: "There is no reason for denying his right to relief, if the plaintiff is otherwise entitled to it, simply because it is asked under the prayer for general relief and upon a somewhat different theory from that which is advanced under one of the special prayers."

The action of the Circuit Court in granting relief upon terms is no interference with the liberty of private contract; it is rather an interference with the liberty to evade a contract. It is no interference with the right to acquire, enjoy and dispose of property. On the contrary, it is in accord with the following utterance of this Court in the third Knoxville appeal:

"Our social system rests largely upon the sanctity of private property, and that State or community which seeks to invade it will soon discover the error in the disaster which follows."

City of Knoxville vs. Knoxville Water Co., 212 U. S. 1, 18.

VII.

THE LEGISLATION WHICH IMPAIRED THE OBLIGATION OF THE CONTRACT IN THIS CASE.

In the decision of this Court on the former appeal in this case (203 U. S. 311) it was held that the ordinance of the City of Columbus proposing to the electors an issue of bonds for the purpose of building waterworks of its own, and the Act of the Legislature of Georgia "passed the day before the day of election * * * should properly be considered together" (p. 320), and the opinion continues as follows:

"Was not this legislation, and legislation of a kind materially to impair the obligation of the contract then existing, and not only to impair, but to wholly destroy its value? We are not called upon now to say whether the exclusive right for thirty years, granted to the Water Company by the contract to supply the City with water, was legal and valid, be-

cause that is a part of the question whether the obligation of the contract has been impaired by the subsequent ordinances of the City and the laws of the State. It cannot be determined that there is an impairment of the obligation of a contract until it is determined what the contract is, and whether it is a valid contract. If it be valid, it still remains to be determined whether the subsequent proceedings of the City Council and Legislature impaired its obligation." (Page 321.)

"In the case at bar * * * there was not merely a denial by the City of its obligation under the contract, but the question is whether there were not new and substantial duties in positive opposition to those contained in the contract created and their performance provided for by the ordinances and act. The act of the Legislature aided the city by granting it power to itself erect waterworks, and to issue bonds in payment of the cost thereof, and the city was proceeding to avail itself of the power thus granted, when its progress was arrested by the filing of the bill in this case and the issuing of a temporary injunction." (Page 322.)

We think that the cases of *Defiance Water Co. vs. Defiance*, 191 U. S. 184, and *Dawson vs. Columbia Ave. &c. Co.*, 197 U. S. 178, have no application to the present case. If the City of Columbus, under the rules recognized in the *Dawson Case* (197 U. S., *supra*), passed the ordinance for the construction of its waterworks under authority of previous legislation, then such ordinance was itself a law within the meaning of the impairment-of-contract clause of the Constitution. If no such authority existed, then the act of December 3, 1902, was legislation within the meaning of that clause.

In view of the foregoing utterances of this Court on the former appeal and of its decisions in the cases cited in the preceding portions of this brief, it is not deemed necessary

to present further argument that the legislation referred to was such as to impair the obligation of the contract.

The ordinance of the City of Columbus referred to in the foregoing extracts will be found on page 37 of the Record.

We append to this brief a copy of the Act of the General Assembly of Georgia, of December 3, 1902, authorizing the City of Columbus to construct, own and operate its system of waterworks, which is alleged by the bill to be legislation impairing the obligation of the contract in question in this case.

It is respectfully submitted that the decree of the Circuit Court should be affirmed.

JOSEPH PACKARD,
A. MORRIS TYSON,
Counsel for Appellee.

APPENDIX.

ACTS OF THE GENERAL ASSEMBLY OF THE STATE OF GEORGIA, 1902, P. 370.

COLUMBUS, WATER-WORKS FOR.

No. 54.

AN ACT to amend the charter of the City of Columbus, in Muscogee county, and the several acts amendatory thereof, so as to confer power and authority upon said city to construct, maintain, own and operate a system of water-works together with the necessary sites, ways, structures, canals, reservoirs for conveying and containing water, and the laying of pipes, conduits, and mains into and through said city, and the use of any stream or streams of water which may be deemed necessary and appropriate for that purpose, and to cross or lay along any street or highway such pipes and mains, and appropriate and occupy the same, or any part thereof; to condemn and appropriate private property upon which to locate its works and to lay its pipes and mains, and to acquire and own property, real and personal, for same, both within the corporate limits of said city or anywhere else, and to have the power and authority generally to do and perform all things necessary to carry into effect the objects and purposes of this act; and to provide for the selection and establishment of a commission to be known as the "board of water commissioners," to whom shall be delegated the supervision and control of the construction, management, and operation of said water-works system, and to define the powers, authority and duties of said commission, and for other purposes.

SECTION 1. *Be it enacted by the General Assembly of the State of Georgia, and it is hereby enacted by the authority of the same,* That the charter of the city of Columbus, in Muscogee county, be, and the same is, hereby amended as fol-

lows: The said city of Columbus is hereby authorized and empowered to construct, build, maintain, own and operate a system of water-works, in any manner and to any extent that may be needful for the present and future use and requirements of said city of Columbus; that said city shall have the power to acquire and hold property, both real and personal, that may be necessary or appropriate for affording a complete and sufficient supply of reasonably pure and wholesome water for its own use and the use of the inhabitants thereof, whether the same be located within the limits of said city, or elsewhere, including the ownership of, and the dominion over, in whole or part, of the watershed or watersheds from which the water to be supplied is gathered, however large the tract of land may be that is requisite for that purpose.

SEC. 2. *Be it enacted by the authority aforesaid*, That the said city shall have power and authority to make or cause to be made such examinations and surveys for the proposed system of water-works contemplated by this act as shall be necessary or proper to the selection of the most advantageous location or locations, site or sites, watershed or watersheds, right or rights, way or ways, for the location of said works and the necessary apparatus, appliances and equipment therefor, and for bringing the water from the source of supply to and distributing it in said city.

SEC. 3. *Be it further enacted*, That said city of Columbus shall have the power and authority to construct its works, and build such dams, canals, raceways and reservoirs as may be necessary for conveying and containing its water, and the laying of such pipes, conduits and mains into and through said city as may be necessary and appropriate for the distribution of said water for private and public use; shall have the power to use and employ for the purpose of said system of water-works any stream or streams of water, watercourse or watercourses, or any part of such waters which shall be deemed necessary and appropriate; and to use such water or waters by employing the same for power to run or move the necessary machinery, or for pumping through the pipes and mains and making distribution thereof over said city; and generally to do and perform all acts and things necessary for the construction, equipment, maintenance and operation of said system of water-works, and the distribution of its water as may be requisite and proper to carry into effect the object, scope and purposes of this act.

SEC. 4. *Be it enacted by the authority aforesaid*, That said city of Columbus shall have the power in the construction of said system of water-works and in making distribution of its water, to lay its pipes and mains under and along any street or streets of said city, or under and along any road or highway of this State; and should it be necessary, to cross, occupy, and appropriate with its works, pipes and mains such streets and highways, or any part thereof; and shall have the right to use the ground or soil under any road, railroad, highway, street, lane, alley, or court within this State, for the purpose of laying its pipes, conduits and mains, and constructing, enlarging and improving any of the work contemplated by virtue of this Act; provided, however, that said city shall not permanently injure any such railroad, highway, street, lane, alley or court, and the same be restored to its original condition and all damages thereto to be repaired; that said city of Columbus shall have the power to lease, buy, take and condemn any property, real or personal, in this State, as may be necessary for the location, construction, operation and security of said works; said city first making and paying just and adequate compensation therefor, as by law provided when private property is taken for public use.

SEC. 5. *Be it further enacted by the authority aforesaid*, That the rights and remedies of said city and all persons, firms or corporations whose property, franchises, easements or rights said city may seek to condemn or appropriate for the purpose herein contemplated, shall be in accordance with, and subject to, the provisions set forth and embodied in sections 4657 to 4686, inclusive, of the Code of Georgia for 1895, and the several acts of the General Assembly amendatory thereof.

SEC. 6. *Be it enacted by the authority aforesaid*, That said city of Columbus shall have the right and power to supply and furnish its water to private consumers, either for motive power or for drinking, sanitary and domestic purposes, charging such rates therefor as in the judgment of the corporate authorities is reasonable and just.

SEC. 7. *Be it enacted by the authority aforesaid*, That for the purpose of carrying into effect the object of this act, the said city of Columbus shall have the power to make any contract or contracts or incur any obligation or obligations upon the means and resources of said city not repugnant to the constitution of this State, and shall have the right to

issue and sell its bonds when so authorized in the manner provided by law for the purpose of raising and supplying the necessary means to accomplish the aims and objects of this act.

SEC. 8. *Be it enacted by the authority aforesaid,* That before the said city of Columbus shall commence the construction of said system of water-works, and before the issue and sale of any of its bonds for that purpose, the mayor and board of aldermen of said city, at any regular meeting thereof, shall elect in the same manner as other officers of said city are elected, a board of commissioners, to be known as the "Board of water commissioners," who shall have the supervision and control of the building, construction. operation and management of said water-works system. The mayor and aldermen of said city shall fill all vacancies that may occur in said board at any regular meeting of council after such vacancy may exist, and that said board of water commissioners shall consist of five persons, one of whom shall be the mayor of said city, who shall be an *ex officio* member, and four other persons, all of whom shall be freeholders and citizens of the city of Columbus and qualified by law to vote at elections held for the selection of mayor and aldermen of said city.

SEC. 9. *Be it enacted by the authority aforesaid,* That the term of office of each member of said board of water commissioners shall be four years, except the members of the first board elected to serve; that the first election for members of said board shall be held at any regular meeting of council after the qualified voters of said city of Columbus have legally authorized at an election held for that purpose an issuance of the bonds of said city for the purpose of building and constructing a system of water-works, at which meeting of council the four persons to constitute the first board shall be elected, one of whom shall be elected to serve until the first day of January first following said election, one to serve until the first day of January thence next following, one to serve until the first day of January thence next following, and one to serve until the first day of January thence next following, so that the term of office of only—member will expire each year; and as the respective terms of office of each member of said board of water commissioners expire, the said mayor and board of aldermen of said city of Columbus, at the regular meeting of council to be held in July of each year prior to the expiration of the term of office

of each member shall elect a successor to the member of said board whose term expires in January following thereafter, who shall be elected for the full term of four years, so that one member of said board shall be elected in July in each year.

SEC. 10. *Be it enacted by the authority aforesaid*, That said board of water commissioners shall choose from their number annually one to serve and act as chairman of said board. The members of said board of water commissioners shall each, before entering into the discharge of his duties, take and subscribe to the following oath: "I (name), do solemnly swear (or affirm) that I am duly qualified to serve as a member of the board of water commissioners of the city of Columbus; that I will, to the best of my ability, faithfully discharge all of the duties and obligations devolving upon me as a member of said board without fear, favor and affection, and will subserve the best interest of the city of Columbus, so help me God," which oath shall be taken before any officer authorized by law to administer oaths.

SEC. 11. *Be it enacted by the authority aforesaid*, That a majority of said board of water commissioners shall constitute a quorum for the transaction of business, and all contracts, engagements, acts and doings of said board within the scope of their duty or authority, shall be obligatory upon and be considered in law as if done by the mayor and board of aldermen of said city of Columbus. Said board shall have the power and authority to make rules and regulations for the conduct of its affairs, and shall keep a record in books to be purchased and kept for that purpose of all acts and doings of said board, which said books shall be subject to examination at any time by persons authorized to do so by the mayor and board of aldermen in said city; and said board shall make reports to the mayor and board of aldermen of said city of Columbus of the operation and condition of said waterworks in accordance with any ordinance or resolution that may be passed by said mayor and board of aldermen with reference to same.

SEC. 12. *Be it further enacted*, That said board of water commissioners shall have the power to appoint a competent engineer for the construction of said waterworks system and to fix his compensation while so employed; also the power to appoint a secretary for said board, and employ such managers, clerks and laborers as may from time to time be found needful in building and constructing said system and in the

operation thereof when completed, and to fix their salaries and compensation; that said board may purchase from time to time such material, machinery, apparatus and appliances as may be needed in the building, construction, maintenance and operation of said works; that all contracts made by said board for material or for construction of said works, or any part thereof, which shall involve an expenditure of over two hundred dollars, shall be made in writing, and of each contract two copies shall be made, one of which shall be deposited with the clerk of council for the benefit of the mayor and board of said city, and one to be retained by said board, and said board shall have the authority to require from any person or persons, firm or corporation with whom they contract, satisfactory security for the faithful performance of said contract, according to its terms, and no member of said board shall be interested directly, indirectly or remotely in any contract relating to the construction or operation of said works.

SEC. 13. *Be it further enacted*, That said board of water commissioners shall regulate the distribution and use of the water in all places and for all purposes whenever the same may be required, and shall fix the price for use thereof and the terms of payment therefor; they shall erect such number of public hydrants and in such places as the mayor and board of aldermen of said city may designate, for the purpose of extinguishing fires, watering the streets, and such other public uses as said mayor and board of aldermen may direct, and shall make all necessary connections with pipes and mains into all buildings used by said city of Columbus and as said mayor and board of aldermen may require. That said board of water commissioners shall have full power and authority to require payment in advance for the use of water furnished by them in or upon any building, place or premises; and in case prompt payment shall not be made, they may shut off the water from such building, place or premises, and shall not be compelled to again supply said building, place or premises with water until all arrears, with interest thereon, shall be fully paid. That said board shall have the power to make rules and regulations respecting the introduction of water into or upon any premises and may regulate the use thereof in such manner as to them shall seem necessary and proper; and the members of said board, and all engineers, superintendents or inspectors in their service and employ, are hereby authorized and

empowered to enter at all seasonable hours any building or other place, where said water is taken and used, and when unnecessary waste thereof is known or suspected, and examine and inquire into the cause thereof. They shall have full power to examine all service pipes, stop-cocks and other apparatus connected with said works, for the purpose of ascertaining whether the same are of the character and dimensions, and fixed in the manner required by the rules and regulations of said board, and if necessary the supply of water may be shut off until the required examination is made and any alterations and repairs necessary are completed.

SEC. 14. *Be it further enacted*, That whatever sum or sums of money that may be provided by the mayor and board of aldermen of the city of Columbus, either from the sale of bonds or otherwise, for the purpose of building and constructing a system of waterworks, as herein provided for, shall be paid over to said board of water commissioners, and by them used and paid out for that purpose only, and should any surplus be left thereof after final completion of said system, shall be turned over to the treasurer of said city of Columbus, and by him used only for the payment of principal and interest on any bonds that may have been issued and sold for that purpose.

SEC. 15. *Be it further enacted*, That all money coming into the hands of said board of water commissioners from water rents and the sale of any apparatus and appliances or other property, or from any other source, after paying for any necessary extensions, repairs and expenses of operation, shall be paid to the treasurer of the city of Columbus semi-annually and at least fifteen days prior to the time of the payment of any principal or interest that may become due on any bonds that may have been issued for the purpose of building and constructing any system of waterworks as is herein provided for, and the same shall be used by said city treasurer only for the purpose of paying any principal and interest then to become due; but if the revenue and receipts of money derived from the operation of said waterworks for any year be more than is sufficient to discharge the interest and principal on said bonds maturing in that year, then such surplus may be used and appropriated by the mayor and board of aldermen of said city for any other public improvement in said city as to them may seem proper.

SEC. 16. *Be it further enacted*, That said "board of water commissioners" shall be considered a subordinate branch of

the city government of Columbus, and shall conform in their actings and doings to all ordinances that may be passed by the mayor and board of aldermen of said city of Columbus; and the mayor and board of aldermen of the city of Columbus may at any time remove any member which they may have elected to said board, if it shall satisfactorily appear, after reasonable notice to the parties, and hearing of the causes of complaint and answers thereto, if any should be offered, that the member whose removal is sought has been guilty of maladministration or neglect of the duties of his office, that his removal will be right and proper, and two-thirds of the aldermen of said city council shall concur in such removal.

SEC. 17. *Be it further enacted*, That the members of said board shall not receive any compensation for their services, but shall be paid and refunded all reasonable expense which they may incur in the performance of their duties; that the mayor and board of aldermen of said city shall be authorized, by and through a committee of their own number, or by any person they may select, to inspect at their pleasure the state and condition of the works, and property thereto belonging, as also all books and accounts pertaining to the affairs conditioned by them, and the said board shall give and furnish them any reasonable facility and assistance in making such inspections.

SEC. 18. *Be it further enacted*, That any person or persons who shall maliciously or willfully divert the water, or any portion thereof, from the works contemplated by this act, or shall corrupt or shall in any manner render the same impure, or shall destroy or injure any canal, aqueduct, pipe, conduit, main, machinery or other property used or required for procuring or distributing the water, such person or persons, and their aiders and abettors, shall forfeit to said board, to be recovered in an action of trespass, treble the amount of damages besides cost of suit which shall appear on the trial to have been sustained, and all such acts are hereby declared to be misdemeanors under the laws of this State, and the person or persons charged therewith, if found guilty, shall be punished as for a misdemeanor, as provided by law.

SEC. 19. *Be it further enacted*, That all laws and parts of laws in conflict with this act be, and the same are, hereby repealed.

Approved December 3, 1902.

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No. 41.

IN THE

Supreme Court of the United States.

OCTOBER TERM, 1910.

THE CITY OF COLUMBUS,
Appellant,

vs.

MERCANTILE TRUST AND DEPOSIT COMPANY OF BALTIMORE, Et Al.,
Appellees.

APPEAL FROM THE CIRCUIT COURT OF THE UNITED STATES FOR THE NORTHERN DISTRICT OF GEORGIA.

STATEMENT, BRIEF AND ARGUMENT IN BEHALF OF APPELLANT.

STATEMENT.

The subject of this litigation is a contract entered into under date of October 7, 1881, between the City of Columbus and Thomas R. White, for the purpose of furnishing the City and its inhabitants with an adequate supply of wholesome water for the present and future requirements. (Trans. p. 108). The contract provided, among other things:

That the storage reservoir should have an available capacity of not less than one hundred and twenty-five million gallons (Sec. 3);

That the supply main should be of ample capacity, and in the beginning should be of twelve inches internal diameter. (Sec. 4);

That the distribution system should be such as to give the greatest amount of fire protection, and the largest amount of water to consumers (Sec. 5);

That the sizes of the street mains should be ample for that purpose (Sec. 9);

That the source of the water supply should be determined by White, he guaranteeing, however, that the supply of water, both in quality and amount, "shall be wholesome, constant and amply sufficient to meet the needs of the city, and private consumers for future and present requirements." (Sec. 10);

That all water supplied to the city should be filtered, the method of filtration required being specified (Sec. 11);

That all alluvial deposits, vegetable and unwholesome matter should be removed from the space to be occupied by the water, and thereafter the resevoir should be kept free from acquatic and other vegetation, and all other proper provision made for cleanliness and purity; and that the reservoir should be so constructed as to avoid all thin edges and cause marginal depths of not less than four feet of water. (Sec. 14);

That "the Mayor and Council are to grant a franchise for the exclusive privilege of maintaining and operating the works for a period of thirty years, or until such time as they may be purchased by the city." (Sec. 14);

That the city should receive for any tax due it the due coupons of any bond issued by Thomas R. White to an amount not exceeding the rental due by the city to him in any one year, and that coupons thus taken shall be received by him as cash in payment of said rentals. (Sec. 15);

That whenever the consumption of water on the line of any street main is so great as to reduce the pressure between the hours of 9 and 10 o'clock, A. M., and 1 and 2 o'clock, P. M., below thirty-two pounds to the square inch, said water main shall be deemed of insufficient capacity. (Sec. 27);

That "the proposed works shall be built in the most substantial manner and of the best materials, and on such a scale as to permit the extension of the pipes, and an enlarged supply for the future

without remodeling or altering the machinery or street mains for many years to come, under ordinary conditions." (Sec. 40);

That the city should have the right at the end of fifteen years from the completion of the works to buy the same at a price to be mutually agreed upon by the parties, or to be arrived at by arbitration; but the city should have the right to decline the purchase of the works after the value may have been declared, upon the payment of the costs and expenses of the arbitration. The right to purchase shall inure to the city every fifteen years upon giving twelve months previous notice to White. (Sec. 42).

Should the gravity system contemplated be found impracticable a pumping system is allowed to be installed in accordance with certain requirements. (Sections 45 and 48).

The Columbus Water Works Company, a corporation organized under the laws of the State of Georgia, became the assignee of this contract, and undertook the performance of the work. The source of the supply was selected by White or his assignee.

Under date of October 31, 1882, the Water Company represented to the city that the work had been completed in conformity with the contract, excepting that in lieu of the filter called for a better one had been provided. Acting upon these representations and upon the assurance of the Water Company that the water supply would be wholesome, constant and abundant, the work was accepted by the city. (Trans. p. 371).

In point of fact the work had not been constructed in conformity with the contract, nor has the water supply been wholesome, constant and abundant as will be hereinafter shown.

In entering into this contract the city had no express legislative authority, nor the sanction of a popular vote. In so contracting the city proceeded in the exercise of its police power pursuant to the

general welfare clause usual in municipal charters. (Trans. 409). The contract was signed on the part of the city by the Mayor and four other persons, whose official capacity does not appear. (Trans. p. 119).

In order to secure an issue of $500,000 of bonds the Columbus Water Works Company on January 1, 1891, executed a mortgage to the Mercantile Trust & Deposit Company of Baltimore, as Trustee, creating a lien upon the property and assets of the Water Works Company, including its franchises and the benefit of its contract with the City of Columbus. Of the bonds so secured $400,000 in amount were issued and disposed of. (Trans. p. 397, 400).

From time to time, and for a series of years, controveries arose between the city and the Water Works Company concerning the sufficiency and wholesomeness of the water supply, the city contending that the requirements of the contract in this and other regards had not been, and were not being, complied with. A large section of the city was entirely without water. The Water Company claimed to have an adequate supply of water, but refused to extend its system to the new territory without assurances and guarantees not required by the contract. (Trans. p. 377-8). At times the quality of the water was exceedingly unwholesome, and the supply inadequate. This condition became so unsatisfactory that mass meetings of the citizens were held in order to devise a remedy if possible. The general discontent found expression in the employment of an engineer to determine what were the needs of the city, and how the desired result could be accomplished. This engineer made his report on November 8, 1893, from which it appeared that the water system was entirely inadequate, and that the service rendered was not that required by the contract. (Trans. p. 255, 837).

In May 1894 a special Committee was appointed by the Mayor of the City to call the attention of the Water Company to the deficiencies in the system and service, and ascertain if appropriate relief would be afforded. (Trans. p. 197, 378). Under date of August 7th, the Water Company made an unsatisfactory reply to the communication of the city. Following this, on October 3, 1894, the special committee was discharged, and an ordinance known as the Rankin Ordinance was adopted, declaring the contract between the city and the Water Company to be not legal and binding. (Trans. p. 208, 379).

The ordinance adopted submitted the question to the qualified voters whether bonds should be issued to construct a municipal system of water works, and a subsequent resolution was adopted pointing out the particulars wherein the Water Company had failed to comply with its contract with the city. (Trans. p. 213).

In November the Water Company submitted a proposition to arbitrate the differences with the city. This offer was declined on the part of the city for the reasons stated in the resolution. (Trans. p. 213). The bond election came on in December and the proposition to issue bonds for the erection of a municipal system was defeated. The Water Company regarded the result of this election as a vindication of its position, and did nothing to improve conditions.

In the Autumn of the following year, 1895, the worst fears of the city came near being realized. There was almost a complete failure in the supply of water. The upper reservoir contained no available water, its surface being covered with mud and trash. The lower reservoir contained slightly more than 7 million gallons, sufficient to last the city only for from a week to ten days. The water was stagnant, disagreeable in odor, and utterly unfit for domestic use. (Trans. p. 217). The occurrence of rain alone saved the city from a water famine.

Notwithstanding the dissatisfaction expressed in the general complaints of citizens, and in the adoption of the Rankin resolution, and notwithstanding the warnings given by the drought of 1895, the Water Company still refused either to extend its system or to increase its supply or to improve its quality. In the following year another bond election was ordered and held, and the issuance of bonds was again defeated. In 1897, the Water Company, evidently regarding the result of the two elections as an endorsement of its methods, at length began the erection of a standpipe on Rose Hill, and the laying of pipes in the new territory. In 1900, water was supplied to this new territory under an agreement with the city (Trans. 156-9).

In the Autumn of 1898 and 1899, the Water supply again became alarmingly low.

Beginning in 1898 an automatic record of pressure was kept. The pressure very frequently fell below thirty-two pounds between the hours of 9 and 10 o'clock A. M., and 1 and 2 o'clock P. M. There was not a month from May, 1898, to December, 1902, that the pressure did not fall below the minimum required. In June, 1902, in response to complaints and by direction of the Mayor, the Fire Chief kept a record of the pressure at the foot of Rose Hill stand-pipe twice a day from June 24th to July 2d. On June 24th, 25th, 26th, 27th, 28th, and 29th, the pressure varied from sixteen to thirty pounds. From this it was manifest that the Rose Hill standpipe was not even kept filled with water so as to afford normal pressure. Because of this state of affairs the city refused to pay the water rentals due July 1, 1902.

Conditions rapidly went from bad to worse. The water in the reservoirs became putrid, and was condemned as utterly unfit for use both by the State chemist and the City Board of Health. Shortly

thereafter the supply failed entirely. Recourse was then had by the Water Company to the Chattahoochee river, and the mains were filled with muddy, polluted and unfiltered river water, taken from a point in the city which was contaminated. Heedless of the warnings which had theretofore been given, the Water Company had made no arrangements for such an emergency and was powerless. The city and its inhabitants were helpless. The river water furnished could not be used for drinking, bathing or culinary purposes, and the pressure afforded was very uncertain and variable. The citizens were forced to have recourse to old wells that were abandoned, or to obtain their water supply from neighboring springs. The situation was most distressing. The health and comfort of the citizens was seriously threatened, and their property was exposed to destruction by fire. In these circumstances the city sought relief in the exercise of its police power.

On July 16, 1902, the Mayor addressed a communication to the Council, declaring that the city was confronted with a situation which demanded the most careful consideration and decisive action; that again, as on frequent occasions in the past, it was demonstrated that with its present plant and equipment, the Water Company is utterly unprepared to discharge its obligations to the city in furnishing a constant and sufficient supply of wholesome water, and that the health, comfort and security of the city was imperiled by the failure of the Company to heed the warnings of former years. (Trans. p. 222). Acting upon this message the Council adopted a resolution declaring that after twenty years of unsatisfactory experience with a private corporation, and inasmuch as an abundant supply of pure and wholesome water was essential to the health, comfort and security of the city, it was resolved that the city should at once outline plans for the construction of a municipal system. (Trans. 223).

At the following meeting of Council, to-wit, on September 14, 1902, an ordinance was adopted submitting to the qualified voters the question whether bonds should be issued for the construction of a municipal plant. In the preamble this ordinance recited that the Water Company had totally failed to supply the city and its inhabitants with a sufficient quantity of pure and wholesome water, and declared the public health of the city to be paramount to every other consideration. The ordinance called a special election to be held on December 4, 1902. At this election the proposition to issue bonds was carried almost unanimously by a vote of 1,640 to 7. Subsequently the legislature of the State specifically authorized the city to construct its own system of waterworks. (Trans. p. 37).

The Act of the General Assembly of Georgia, approved December 2, 1902, authorizing the City of Columbus to construct and operate a municipal system of waterworks is quite long and goes into much detail with regard to the methods to be employed in providing for construction, and for the protection and subsequent operation of the works. Those portions of the Act that are deemed to be pertinent to the issues in this case are as follows:

Section 1.

> "Be it enacted by the General Assembly of the State of Georgia, and it is hereby enacted by the authority of the same, That the charter of the City of Columbus, in Muscogee County, be, and the same is, hereby amended as follows: The said City of Columbus is hereby authorized and empowered to construct, build, maintain, own and operate a system of waterworks, in any manner and to any extent that may be needful for the present and future use and requirements of said City of Columbus; that said city shall have the power to acquire and hold

property, both real and personal, that may be necessary or appropriate for affording a complete and sufficient supply of reasonably pure and wholesome water for its own use, and the use of the inhabitants thereof, whether the same be located within the limits of said city, or elsewhere, including the ownership of, and the dominion over, in whole or part, of the watershed or watersheds from which the water to be supplied is gathered, however large the tract of land may be that is requisite for that purpose.

* * * *

Section 6.

"Be it enacted by the authority aforesaid, That said City of Columbus shall have the right and power to supply and furnish its water to private consumers, either for motive power or for drinking, sanitary and domestic purposes, charging such rates therefor as in the judgment of the corporate authorities is reasonable and just.

Section 7.

"Be it enacted by the authority aforesaid, That for the purpose of carrying into effect the objects of this Act, the said City of Columbus shall have the power to make any contract or contracts or incur any obligation or obligations upon the means and resources of said city not repugnant to the Constitution of this State, and shall have the right to issue and sell its bonds when so authorized in the manner provided by law for the purpose of raising and supplying the necessary means to accomplish the aims and objects of this Act."

The Act in full will be found on Page 370, Georgia Laws 1902.

Following this election, to-wit.: on December 22,

1902, the Mercantile Trust & Deposit Company of Baltimore (one of the appellees herein) as Trustee for the holders of the bonds of the Water Works Co. filed its bill in the United States Circuit Court for the foreclosure of the mortgage, and for a receiver in aid thereof. A receiver was appointed and under authority of the Court issued $50,000 of receiver's certificates, devoting the proceeds to the improvement of the water system for the purpose of securing an adequate supply of wholesome water. (Trans. p. 306). At the time this bill of foreclosure was filed there had been no default in the payment of interest on the bonds. The default alleged was the failure on the part of the Water Company to observe its covenant to so maintain its system as to enable it to provide an adequate supply of water to the City of Columbus and its inhabitants. In the bill it was averred upon information that for more than six months preceding the Water Company had suffered the security of the bondholders to become impaired by not keeping its system supplied with all the machinery, equipment, and appliances necessary for providing water to the City of Columbus and vicinity, and by not making proper additions, betterments and improvements to its plant. It sug-suggested rather than averred that the default on the part of the Water Company was directly caused by a failure in its source of water supply; and it was stated that owing to the attitude of the City of Columbus in taking steps to provide a water system of its own, the Water Company could not sell its bonds to raise money, and was therefore unable to provide a source of adequate supply. (Trans. p. 299).

The receiver apointed under this proceeding has since operated the Water Works Company under the orders of the Court.

On May 6, 1903, the Mayor and General Council of the City of Columbus adopted a resolution direct-

ing that bids be invited for the purchase of the bonds authorized for the construction of a municipal water plant, the bids to be opened on August 1, 1903.

Pending the receipt and opening of such bids, to-wit.: on July 30, 1903, the Mercantile Trust & Deposit Company of Baltimore, as Trustee under the mortgage hereinbefore referred to, filed its bill in the Circuit Court of the United States, for the Northern District of Georgia, Western Division, alleging that in adopting the ordinance of September 14, 1902, and in proceeding thereunder to invite bids for the purchase of the bonds proposed to be issued, the city had violated the obligations of its contract with White, and was about to take the property of the Water Company without just compensation, and without due process of law. To this bill the Columbus Water Works Company, a corporation and citizen of the State of Georgia, was made a defendant. The right to maintain the suit proceeds upon the theory that the conduct of the city was such as to impair the obligation of its contract, and that the benefit of such contract having been pledged as security for the bonds, the Trustee for the bondholders might in their interest, enforce the said contract, and protect its obligations from impairment. It was not claimed that any contractual relation existed between the Trust Company and the City. Whatever rights the Trust Company may have had as against the city were derived from and dependent upon the trust mortgage executed by the Water Works Company to secure its bonds. The city was not a party to this mortgage.

The bill alleged that the contract in question conferred upon the Water Company the exclusive privilege of maintaining and operating water works in the city during the life of the contract. It further alleged that the ordinance of September 14, 1902, the election held in pursuance thereof, and the resolution inviting bids for the purchase of the bonds

amounted to a repudiation of the contract by the City, and a disavowal of any liability thereunder. (Trans. p. 9).

The prayers of the bill were: (a) For an injunction forbidding the city to take any further steps to sell its bonds, and enjoining the city from proceeding to construct, install and operate a municipal water system; (b) that the contract between the city and the Water Company be declared valid, enforceable, and that the city and the Water Company be held to a specific performance. (Trans. pps. 15-16).

To this bill the City of Columbus demurred upon the grounds:

(a) That the plaintiff had no such interest in the subject matter as entitled it to maintain the suit, or to call upon the defendants to answer its demand.

(b) That there is no equity in the bill, because (1) there is no obligation upon the city, either contractual or otherwise, not to erect its own system of water works; (2) it is not alleged that the City of Columbus has revoked the franchise granted the Water Company, or has attempted to do so; (3) the city could not legally grant an exclusive franchise for the use of its streets to the Water Company, and any attempts to do so is void and in contravention of the constitution and laws of Georgia; (4) for any violation of the contract on the part of the city by refusing to take or pay for the water there is an adequate remedy at law; (5) the Water Company being insolvent, and its affairs being administered by a receiver of the Court, it has been deprived of the power and is unable to comply with its obligations under the contract with the city.

(c) That no federal question is presented.

(d) That there is an adequate and complete remedy at law for the wrong and injury complained of. (Trans. pps. 45, 47).

This demurrer after argument of counsel was overruled by the Court. (Trans. p. 100).

On an interlocutory hearing an injunction pendente lite was issued restraining the city from taking further action towards the issuance or sale of bonds for the purpose of establishing a water works system by said city. (Trans. p. 106).

The City filed its answer to the bill of complaint, taking issue with the material allegations of the bill, and setting up that the Water Works Company had failed to comply with its contract with the city, and that the city in adopting the ordinance providing for the construction of a municipal water system, proceeded in the exercise of its police power, and in the execution of its municipal trust. (Trans. pps. 67, 80).

The city also filed a cross bill. In this cross bill it was alleged that the Columbus Water Works Company had failed to perform and carry out the contract with the city; and that by reason of the defaults and breaches of the contract on the part of the Water Works Company, the city was entitled to affirmative relief by way of rescission and cancellation of the contract. The particular defaults and failures of the Water Company were pointed out. It was alleged that the water supply was inadequate, and frequently the water was contaminated and unwholesome; that the distribution system was insufficient to carry the necessary amount of water, and furnish the requisite fire pressure; that the Water Company had failed to extend its system so as to keep pace with the growth of the city; that in the summer of 1902 the water became foul in odor, unwholesome to the last degree, and unfit for any domestic use, following which the supply was completely exhausted; that resort was then had to the Chattahoochee River, the water being taken from a point in the ~~river~~ city contaminated by sewerage, and was de-

livered unfiltered to consumers, so that the citizens were entirely without supply of water fit for domestic use, and were forced to have recourse to old wells and neighboring springs. Confronted with this state of affairs, and apprehensive that an epedemic of disease and death might ensue, the Mayor and Council, in the exercise of police power of the city, adopted an ordinance on September 14, 1902, and took other steps looking to the construction of a municipal system. It was prayed that the contract be cancelled and set aside because of the continued breaches and defaults of the Water Works Company. (Trans. p. 85, et seq.).

The answer of the defendants was a general denial that the Water Works Company had been guilty of such defaults and breaches as entitled the city to a cancellation of the contract. (Trans. pps. 91, 95, 96).

The cause both on the bill and the cross bill was referred to the Standing Master, Honorable H. R. Goethchius, for investigation and report upon all the issues of law and fact involved. (Trans. pps. 106, 107).

The Master's report sets out a full abstract of these pleadings, and the proceedings had therein. (Trans. pps. 357-370).

REPORT OF THE MASTER.

The Master in an able and elaborate report found substantially all of the issues of fact in favor of the contentions of the city. He found, among other things, as follows:

That the system as constructed failed to meet the general requirements of the contract. (Trans. p. 377).

That the acceptance of the work by the city was based upon the representations of the Water Company that the system had been completed in conformity with the requirements of the contract, and upon the assurance that the water would be wholesome, abundant and constant. (Trans. p. 371).

That the Water Company has never complied with its obligation to furnish a reservoir of one hundred and twenty-five million gallon capacity; the reservoir first built having a capacity of only 13,078,000 gallons, and the combined capacity of the two reservoirs being only 51,470,000. (Trans. p. 384).

That no filter or other effective method for cleansing or purifying the water was ever installed. The result was that the water was often foul and filled with mud and other matter. (Trans. p. 384-5).

That the distributive system is inadequate, for that it contains many unconnected or dead ends, and the mains are too small to furnish a full supply of water even should the quantity be ample and the pressure sufficient. (Trans. p. 387).

That the Water Company has failed to furnish a constant supply of wholesome water, sufficient to meet the needs of the city and private consumers, for present and future requirements, as required by the contract, and that such supply can not be furnished from the source selected. (Trans. p. 389).

That the supply main, connecting the reservoirs with the distributive system, is too small and not in compliance with the contract. The increased use of the water had decreased the pressure, and it was evident in 1902 that the supply main was inadequate to furnish the city with water and pressure. (Trans. p. 389).

That the pressure was variable and uncertain; the gravity plan could not sustain it to the requirements of the contract; the stand-pipe and pumping devices were not at all times satisfactory; and that the Company had not met the requirements of the contract

by maintaining a pressure of thirty-two pounds, nor the requirements of the supplemental contract requiring forty pounds; and that the pressure and water supply is insufficient and not ample for fire protection, as required by the contract. (Trans. p. 393).

That the water furnished from the reservoirs is not wholesome in seasons of low water; nor can the Chattahoochee River be relied upon as a constant source of supply for wholesome water. (Trans. p. 396).

That the purchasers of the Water Company in 1890 acquired the stock without consideration; that the property was acquired by the issuance of bonds largely in excess of its actual value, which fact was or should have been known to the syndicate purchasing the bonds; that the proceeds of the bonds, less the amount used to retire a previous issue, inured to the benefit of the individual members of the purchasing company; and that the present holders of the bonds purchased them from and on the representations of the bond syndicate. (Trans. p. 398-9).

That the Water Company has not maintained and improved its system as the growth of the city demanded; that substantially all extensions made since 1891 were paid for from the proceeds of an increase of the bonded debt originally out of proportion to the value and earning capacity of the property; and that the system has not been reinforced as its needs required, which fact was recognized by the owners of the bonds. (Trans. p. 403).

On the questions of law involved, the Master found among other things:

That the contract did not create a debt in violation of the constitution of Georgia. (Trans. p. 411).

That the agreement on the part of the city to accept due coupons of the bonds of the Water Com-

pany in payment of rentals due by the city, constituted no guaranty of payment giving credit to the bonds. (Trans. p. 411).

That the city was without authority to grant an exclusive franchise to the Water Company, for that no such power was given under its charter or the laws of this State. (Trans. p. 413).

That, notwithstanding the city had no such power, which can never be implied, nevertheless the grant of the franchise is to be construed to mean that the city would not enter into competition with the Water Company during the contractual period, and that the grant was permissible as an incident to the performance of the principal undertaking. (Trans. p. 417).

That the Act of December 3, 1902, did not operate as a revocation of any right or franchise granted the Water Company by the City, the Master stating that this conclusion was abstract inasmuch as other considerations controlled the case. (Trans. p. 419).

That under the law and facts the city had the right in the exercise of its police power to provide for its own system of waterworks, subject to a proper adjudication of the contract rights of those affected by the exercise of the power. (Trans. p. 423).

That the conditional acceptance of the works by the city in 1882, and its continued acceptance of service since that time, does not estop it from seeking the affirmative relief prayed in the cross bill, the Water Company having admitted its inability to maintain and operate the works in accordance with the contract. (Trans. p. 425).

That the default and inability of the Water Company to perform its contract relieved the city from its reciprocal obligations. (Trans. p. 425).

That the clause in the contract permitting the city to purchase the works at periods of fifteen years conferred upon the city a mere privilege. (Trans. p. 426).

That the holders of the bonds of the Water Company have no greater legal right than the Company itself to a continuance of the present contract, and the city being entitled to a cancellation thereof as against the Company, it has a similar right against the bondholders, who have no legal right to a continuance of the contract for their benefit.

That the City is entitled to have the contract rescinded and set aside, and should be permitted to construct and operate its own system of water works. (Trans. p. 429).

That the Water Company is not entitled to the enforcement of its contract nor to the validation thereof, nor to an injunction against the city carrying out the purposes of its ordinance. (Trans p. 429).

The Master also saw fit to place a valuation upon that part of the distribution system of the Water Company, which in his opinion, could be made available by the city in its operation of the new system; (Trans. p. 405-6), and upon this he recommended a special reference for an exact determination of this question; and further recommended that the city should be required to purchase that portion of the system at a value to be ascertained, and make payment therefor, or that in default thereof, the city be enjoined and the complainant be permitted to carry out the old contract. (Trans. p. 432-3).

EXCEPTIONS TO REPORT OF THE MASTER.

The Mercantile Trust & Deposit Company of Baltimore, complainant below, excepted to all of the findings and conclusions of the Master. These exceptions are so numerous and voluminous that reference must be had to the printed copy. (Trans. p. 437). The city excepted to practically none of the findings of fact upon issues raised by the pleadings.

The city did except to the finding of the Master with respect to the value of that portion of the system which could be made available, upon the ground that it is not responsive to any issue raised by the pleadings, is without evidence to support it, and is irrelevant to a correct determination of the cause. To the recommendation of the Master that the decree in favor of the city should be made conditional, the city excepted on the following grounds:

1. That the question whether the city should be required to purchase any part of the system is not raised by the pleadings, is not in issue, and was not discussed by counsel, and is irrelevant.

2. That the Court is without authority to make the decree conditional, for that under the law and facts, the City is entitled to an unconditional decree as a matter of right and not of grace.

3. That the city being entitled as of right to a decree in its favor, the requirement that it shall purchase any part of the system at any price violates the liberty of private contract, and is beyond the jurisdiction of the Court.

4. That there is no superior right or equity in favor of the bondholders that entitles them to any relief that could not properly be accorded the Water Company. (Trans. p. 519-522-3; Ex. X.).

After the exceptions to the Master's report had been argued, and pending a decision by the Circuit Court, this Court rendered its opinion in the case of the City of Dawson vs. Columbia Avenue, etc. Co., 179 U. S. 178. Believing that case to be controlling on the point, a motion was made to dismiss this case for want of jurisdiction on the ground that no federal question was involved. The Circuit Court sustained the motion and dismissed the bill. This Court reversed the order and decree of the Circuit Court. Mercantile Trust & Deposits Company of Baltimore, vs. City of Columbus, 203 U. S. 311.

Thereafter the case was re-argued in the Circuit Court, and final decree on the merits entered therein.

OPINION AND DECREE OF THE COURT.

The report of the Master was confirmed in all material respects, except that the Court was of the opinion that the City had the legal right to grant an exclusive franchise for the operation of a water system for a period of years, and that the contract in this case conferred such exclusive privilege upon the Columbus Water Works Company. (Trans. 536). The Court also thought that a decree granting or refusing an injunction against the City would settle the rights of the parties, so that a decree upon the cross bill would be unnecessary. (Trans. p. 539).

Discussing the recommendation of the Master as to the conditions upon which a final decree denying the injunction sought against the City should be granted the Court concluded that the City should be required to take over the plant of the Water Works Company, or so much thereof as might thereafter be determined, at a fair valuation, as a condition of and before entering a decree in favor of the City finally denying the injunction. (Trans. pps. 540-541).

The City declined to accept an injunction on the conditions named, (Trans. p. 543); and thereupon a final decree was entered granting the injunction prayed for in the original bill. (Trans. p. 544). This decree, among other things, provided as follows:

> "That the City of Columbus as against complainant and the bondholders represented by complainant, should in equity be required to take the waterworks plant, or so much of the waterworks plant as may hereafter be estimated at a fair valuation, to be ascertained by arbitration in the manner provided in the contract, whenever the city shall elect so to do, or to be ascertained by experts appointed by the Court, in the event the city should desire to establish municipal ownership, and as a condition to its right to do so. And leave is hereby granted to the City of Columbus to apply to the Court for the appointment of said experts, and for such supplemental decree as may be necessary to carry into effect this provision."

To this decree an appeal to this Court was entered and allowed. (Trans. 547-8).

ASSIGNMENTS OF ERROR.

I.

The Circuit Court erred in overruling the demurrer to the original bill of complaint in the above entitled cause.

II.

The Circuit Court erred in not dismissing said original bill of complaint, because the complainant has no such interest in the subject matter as entitles it to maintain its suit, for that there is no privity of contract between the complainant and the defend-

ants named, or either of them, nor are any facts alleged upon which an independent suit at the instance of the defendant can be predicated.

III.

The Circuit Court erred in not dismissing said original bill of complaint, because there is a want of proper parties, for that The Columbus Water Works Company and W. S. Greene, as receiver thereof, are indispensable parties complainant.

IV.

The Circuit Court erred in not dismissing said original bill of complaint, because there is a misjoinder of parties defendant in this, to-wit.: The Columbus Water Works Company is not a proper party defendant, for that its interest in the controversy is wholly that of a complainant.

V.

The Circuit Court erred in not dismissing said original bill of complaint for want of equity, because:

(1) There is no obligation resting upon the City of Columbus, either contractual or otherwise, binding it not to erect its own system of waterworks.

(2) It is not alleged that the City of Columbus had revoked the franchise granted to The Columbus Water Works Company, or attempted to do so.

(3) The City of Columbus as a municipal corporation of the State of Georgia could not legally grant any exclusive franchise for the use of its streets to The Columbus Water Works Company, and any attempt to do so on the part of its Mayor and Council is void, and in contravention of the Constitution and laws of Georgia.

(4) The Columbus Water Works Company being insolvent and all of its property, rights, and assets having been placed in the hands of a receiver under the order of said Circuit Court, The Columbus Water Works Company is unable, and has been deprived of its power, to comply with its obligation under its contract with the City of Columbus.

VI.

The Circuit Court erred in overruling the demurrer to the amended bill of complaint in the above entitled cause, because:

(1) The bill as amended is without equity.

(2) The said amendment is not germane to the cause of action set forth in the original bill, and is in effect an application to the Court to be allowed to pledge and issue receiver's certificates for the purpose of enabling the receiver to relieve the default and to carry out the obligations of the contract. The amendment shows that The Columbus Water Works Company had failed to comply with the obligations of its contract to furnish the City and its inhabitants with a wholesome, constant and adequate supply of water for domestic use and fire protection.

VII.

The Circuit Court erred in not dismissing the bill of complaint, as amended, because it appears from the ordinance of the City of Columbus providing for an election to determine whether the City should issue bonds for the purpose of constructing its own system of waterworks, a copy of which ordinance is attached to said original bill, that in abrogating its contract with said Water Works Company, and providing for the construction of its own system, the City acted in the exercise of its police power, and in due execution of the municipal trust committed to it.

VIII.

The Circuit Court erred in not sustaining the exceptions to the Master's report filed in behalf of the City of Columbus.

IX.

The Circuit Court erred in not sustaining the exceptions to that part of the Master's report finding the value of that portion of the existing waterworks system which in the Master's opinion could be made available by the city in connection with its proposed system, because:

(1) Whether any portion of the system of the Columbus Water Works Company could be made available to the City in the construction of its proposed system, and the value of such portion, were not issues raised by the pleadings and are irrelevant to a correct determination of the cause.

(2) No evidence was adduced by either party with respect to such questions, the same not being in issue, nor were these questions, or either of them, discussed by counsel in the argument.

(3) There is no evidence in the record to sustain the said findings of the Master.

X.

The Circuit Court erred in holding and deciding that the contract between the City of Columbus and the Columbus Water Works Company, as assignee of Thomas F. White, did not create a debt in contravention of the Constitution and laws of the State of Georgia, because the question of incurring such indebtedness was not submitted to a vote of the people, as required by the Constitution of the State.

XI.

The Circuit Court erred in holding and deciding that the contract in question conferred upon the

Water Works Company an exclusive franchise or privilege of furnishing the city and its inhabitants with water for a term of years not yet expired; whereas, the contract should have been so construed as conferring an exclusive privilege of supplying water to the city and its inhabitants from the source selected and by means of the system constructed, leaving the city free to adopt any other source of supply and such other means of distribution as should not infringe upon such special privilege.

XII.

The Circuit Court erred in holding and deciding that under the Constitution and laws of the State of Georgia, the City of Columbus had power and authority to make a contract granting an exclusive franchise or privilege for a term of years; whereas the granting of such exclusive franchise or special privilege is forbidden to the City by the Constitution and laws of the State.

XIII.

The Circuit Court erred in holding and deciding that under "the general welfare clause" of the city's charter it was authorized to enter into a contract granting an exclusive privilege for a term of years; whereas the city was without any express authority to make such contract or to grant such exclusive privilege, and under the Constitution and laws of the State no such authority could have been given to the City by the General Assembly.

XIV.

The Circuit Court erred in holding and deciding that the right of the city to make an exclusive contract for the supplying of water to the city and its inhabitants was a necessary and indispensable incident to its right to exercise the police power under

the general welfare clause of its charter; because the grant of an exclusive franchise for a term of years is not an indispensable incident to a contract for a water supply in the exercise of the inherent power of the City to provide for the health and comfort of its citizens and for the protection of property against fire.

XV.

The Circuit Court erred in failing and refusing to hold that the contract in question, in so far as it may have granted an irrevocable special privilege or exclusive franchise, if any, contravened the provision of the Georgia Constitution forbidding the making of irrevocable grants of special privileges or immunities.

XVI.

The Circuit Court erred in holding and deciding that a revocation of the contract in question would offend that provision of the Georgia Constitution declaring that no grant of special privileges or immunities shall be revoked except in such manner as will work no injustice to the corporators or creditors of the corporation; because the ordinance of the city providing for the construction of its own municipal system, and the acts done in pursuance thereof, in no wise interfered with the physical, tangible property of said Water Works Company, or of its right to continue to operate its own system, and for that purpose to use the streets of the city, but only affected the exclusive right claimed under the contract to furnish the City and its inhabitants with water.

XVII.

The Circuit Court erred in holding and deciding that this case comes within, and is controlled by the

decision of the Supreme Court in the case of Vicksburg vs. Vicksburg Water Works Company, 202 U. S. 453; and the Court erred in holding that there is no material difference between the local law in Mississippi and the local law in Georgia at the time the contract in question was entered into; whereas there is a material and decided difference in said local laws. The provision in the Constitution of the State of Mississippi, relied upon in the Vicksburg case, was adopted after the contract there involved had been entered into, while in this case the Constitutional provisions referred to preceded and were in force at the time of the execution of the contract in question; and also because at the time the contract was entered into the Constitution and laws of the State of Mississippi, as construed by the Supreme Court of the State, authorized the granting of exclusive privileges, while the Constitution and laws of the State of Georgia forbid such irrevocable grants.

XVIII.

The Circuit Court erred in failing and declining to hold that the City of Columbus was justified in the exercise of its police power in seeking another source of water supply, and in undertaking to construct a municipal system of waterworks, under the circumstances and conditions as they existed at the time, without thereby incurring any obligation to the Columbus Water Works Company, or to the holders of its bonds; because the Master found that the Water Works Company had failed and was unable to comply with the requirements of the contract for supplying the City with an adequate quantity of wholesome water; and the Circuit Court declared that the facts in evidence were sufficient to justify the Master in finding that there was a failure on the part of the Water Works Company to furnish an abundant supply of pure and wholesome water as provided

in the contract, and finding the Company at fault in this respect.

XIX.

The Circuit Court erred in holding and deciding that notwithstanding the default and inability of the said Water Works Company to comply with the requirements of the contract, the City of Columbus should be restricted in the exercise of its police power by assuming the obligation to purchase the whole or some part of the system of the Columbus Water Works Company; whereas the city should not be hampered in discharging its high municipal trust by the proper exercise of its police power.

XX.

The Circuit Court erred in declining to grant the relief prayed under the cross bill; because the said Water Works Company had failed, and was confessedly unable to comply with the requirements of the contract to furnish the city and its inhabitants with an abundant, wholesome and continuous supply of water for domestic and sanitary uses and for fire protection.

XXI.

The Circuit Court erred in declining to grant the city an unconditional decree in its favor, under its cross bill, rescinding and setting aside the contract in question because of the admitted defaults of the Water Works Company, and its recognized inability to comply with the requirements.

XXII.

The Circuit Court erred in requiring the city as a condition of a decree in its favor to purchase the whole or any part of the system of the Columbus

Water Works Company upon a valuation to be arrived at by arbitration or to be otherwise ascertained by the Court, because:

(1) The question whether the city should be required to purchase any part of the water works system is not raised by the pleadings, is not in issue, and was not discussed by counsel, and is irrelevant to a correct determination of the controversy.

(2) The Circuit Court is without authority to make the decree conditional, for that under the law, and under the facts as found by the Master and approved by the Court, the city is entitled to an unconditional decree in its favor as a matter of right and not of grace.

(3) The City being entitled as of right to a decree in its favor the requirement that it shall purchase any part of the Water Works system at any price violates the liberty of private contract and is beyond the province of the judiciary.

XXIII.

The Circuit Court erred in holding and deciding that the holders of the bonds of the said Water Works Company, represented by the complainant as trustee, had become vested with a right ~~of~~ equity as against the City superior to the right and equity of the Water Works Co. with regard to the contract in question; whereas there being no privity of contract between the said bondholders and the City of Columbus, and the Master having found that said bondholders had purchased their bonds with full notice of the contract, the rights and equities of the bondholders as against the city are no higher than those of the Columbus Water Works Company.

XXIV.

The Circuit Court erred in holding and deciding that because the bondholders consented to the is-

suance of receiver's certificates as a first charge on the property and incomes of the Water Works system for the purpose of enabling the receiver to so improve the system as to be able to meet the requirements of the contract, thereby substantially improving the service, and because the City of Columbus and its inhabitants have since taken and paid for water, the bondholders have acquired an equity superior to the legal right of the city to have the contract rescinded because of the defaults of said Water Works Company; whereas the city's hands being tied under the orders of the Court it was under the imperious necessity of using the only available water supply, for which it was in good conscience bound to pay, and the bondholders have not acquired any superior equity by reason of the facts alleged.

XXV.

The Circuit Court erred in holding that the maxim: "He who seeks equity must do equity," is applicable to this case, because the maxim is only applied in those cases in which the party invoking it is vested with a superior equity, and in those cases in which the relief prayed is discretionary; whereas the maxim can have no application to a party standing upon his legal rights and asking no favors of the Court.

XXVI.

The Circuit Court erred in holding and deciding that upon the option given the city by the contract in question of purchasing the water works system at stated periods, upon a valuation to be arrived at by arbitration, adds to the duty of the city to take the waterworks plant at a fair valuation; and the Court erred in holding that such option adds something to the equities of the bondholders; because a mere option imposing no obligation unless exercised can not be made to limit the legal rights of the city nor to create equities in favor of third persons.

XXVII.

The Circuit Court erred in ordering and decreeing that the contract in question between Thomas R. White and the Mayor and Council of Columbus was a valid and binding contract.

XXVIII.

The Circuit Court erred in ordering and decreeing that the City of Columbus had authority to make the contract in question: that the contract did not create a debt in violation of the Constitution of the State of Georgia, and was not invalid by reason of its exclusive feature, or for any other reason.

XXIX.

The Circuit Court erred in ordering and decreeing that the contract in question granted an exclusive privilege, and that the City of Columbus was thereby precluded from entering into competition with the Water Works Company by erecting, maintaining and operating a system of its own during the continuance of the contract.

XXX.

The Circuit Court erred in ordering and decreeing that the complainant, Mercantile Trust & Deposit Company as Trustee, is entitled to the rights, benefits and provisions of the contract in question.

XXXI.

The Circuit Court erred in ordering and decreeing that the City of Columbus should be required to purchase the Water Works plant, or so much thereof as may be thereafter ascertained, at a valuation to be arrived at by arbitration, or by experts appointed by the Court, as a condition of the City's right to establish a municipal water works system of its own.

XXXII.

The Circuit Court erred in ordering and decreeing that unless and until the City of Columbus should purchase the existing waterworks system, or some part thereof, the city, its officers, servants and agents, should be enjoined from taking further action towards the issuance or sale of bonds for the purpose of establishing said waterworks by said city, and from erecting, maintaining, or operating said waterworks, or from supplying water for fire protection, or other municipal purpose, or laying or permitting the laying of mains or other waterworks, or water pipes, or for the construction of waterworks, in violation of the contract in question.

XXXIII.

The Court erred in ordering and decreeing the costs of the suit against the defendant. (Trans. 599 et seq.)

ARGUMENT.

The argument in behalf of the appellant may be condensed into the following propositions:

(a) The contract is not to be construed as granting an exclusive privilege to the Water Works Company for furnishing the city and its inhabitants with water for the period of thirty years.

(b) If so construed the grant was beyond the power of the city to make under the Constitution and laws of the State of Georgia.

(c) Even if lawfully made in the first instance such a grant of special privilege was revocable; and in this case the exclusive feature of the grant was revoked by the State and the city by the exercise of the police power.

(d) Had the contract been in all respects valid, and an exclusive franchise been granted, the city was excused from further performance by the continued defaults and breaches on the part of the Water Works Company, and its confessed inability to carry out the obligations of the contract.

The appellant further contends that under the facts as found by the Master, and approved by the Court, and the law applicable thereto, the city was entitled to a decree in its favor; and that the Court was without right or power to impose as a condition that the city should purchase the plant and system of the Columbus Water Works Company, or any part thereof.

I.

The contract conferred upon the Water Works Company no exclusive right to furnish the city and its inhabitants with water; and hence the construction by the city of its own water system would offend no constitutional principle.

No such exclusive privileges or franchise was granted by the city.

The language of section 14 of the contract is as follows:

> "The mayor and council are to grant a franchise for the exclusive privilege of maintaining and operating the works for a period of thirty (30) years or until such time as they may be purchased by the city."

This language is not to be construed in deprivation of the right of the city to erect its own system of waterworks, or to grant that privilege to another, provided it adopts a source of supply other than that selected by the Columbus Water Works Com-

pany, and does not seek to impair the right of the Company to use the streets of the city for its pipes and mains. The contract having provided that White should select the source of water supply, and should construct the works in accordance with certain specifications, the franchise granted only contemplated that he should have the exclusive right to maintain and operate "the works" as so constructed. The source of supply selected by White having proven deficient, and having been practically abandoned, the Water Company as his assignee has no exclusive right to supply the city with water derived from another source.

It had become manifest that the source of supply selected by White had proven inadequate. (Trans. p. 389). The supply was insufficient, and in seasons of low rainfall the quality of the water was such as to render it unfit for domestic use. (Trans. 394, 396). The city was therefore at liberty to seek another source in order to remedy these deficiencies.

It is conceived that the proposition here contended for is fully sustained by the case of Stein v. Bienville Water Supply Co., 141 U. S. 67.

II.

It was beyond the power of the City to grant an exclusive franchise so as to create a monopoly, and deprive its citizens of the right to obtain a wholesome and adequate supply of water for sanitary and domestic purposes, and for protection against fire.

An attempted grant of exclusive privilege is in derogation of the governmental powers conferred on the city in trust for the benefit of its citizens; offends public policy; and is in contravention of the established principles of general law.

At the time the contract was entered into the char-

ter of the city was absolutely silent with respect to any power either to construct waterworks of its own or contract with private parties for this service, or to grant any franchise for this use, either general or exclusive. Its right to contract for a supply of water for its inhabitants rested upon the general welfare clause of its charter, and upon the inherent right of a municipality to provide for the health and comfort of its citizens. (Trans. pps. 409-10). It is well settled that only the legislature, acting directly or through powers delegated to a public corporation, can grant an exclusive right or franchise. Such a right in a municipality is never to be implied, and even if it should be conferred in doubtful terms the doubt would be resolved in favor of the public.

Mr. Justice Nelson in Minturn v. LaRue, 23 How. 453, 16 L. Ed. 574, declares the principle as follows:

> "It is a well settled rule of construction of grants by the legislature to corporations, whether public or private, that only such powers and rights can be exercised under them as are clearly comprehended within the words of the Act or derived therefrom by necessary implication, regard being had to the objects of the grant. Any ambiguity or doubt arising out of the terms used by the legislature must be resolved in favor of the public. This principle has been so often applied in the construction of corporate powers, that we need not stop to refer to authorities."

In Wright v. Nagle, 101 U. S. 791, 25 L. Ed. 921, it is held that exclusive rights to franchises are not favored and will never be presumed. In that case it appeared that the statutes of Georgia authorized the inferior courts to confer franchises for the establishment of ferries and bridges, but the court said that such a power did not confer the right to tie

the hands of the public with respect to its future necessities.

The court, speaking by Mr. Chief Justice Waite, said:

> "Every statute which takes away from the legislature its power will always be construed most strongly in favor of the State. These are elementary principles. The question here is, whether the legislature of Georgia conferred on the inferior courts of its several counties the power of contracting away the rights of the State to establish such ferries and bridges in a particular locality as the ever changing wants of the public should in the progress of time require. In our opinion it did not. It gave these courts the right to establish ferries and bridges, but not to tie the hands of the public with respect to its future necessities."

The right of a city to grant an exclusive franchise to a water company being before the Circuit Court of Appeals for the Eighth Circuit, in the case of Illinois Trust & Savings Bank v. Arkansas City, 76 Fed. 271, it was there held that a city having power to contract with a private party for the construction and operation of water works, to agree to pay rents for the use of hydrants, and to grant such a party the use of its streets for the purpose of laying pipes, had no power to grant the exclusive right to use its streets for that purpose.

In that case, Circuit Judge Sanborn says:

> "The general rule is that the legislature alone has the right to make exclusive grants of this character, and that this authority does not vest in the municipality, unless it is expressly granted to it by its charter. It will be further conceded that, if a grant of a similar privilege in its

streets, not exclusive, had been subsequently made by this city to another corporation, and that corporation was about to proceed to construct another system of water works in this city, neither the gas company nor the city itself could maintain a bill to enjoin such proceedings. Since it was beyond the power of the city to make the grant of the privilege exclusive, that portion of the grant would not sustain a bill to restrain the violation of its terms."

In the case of Jackson Co. R. Co., v. Interstate, etc., Co., 24 Fed. 306, Judge Brewer held that a city could not grant to a street railway company an exclusive right for a term of years to construct, maintain and operate a railway over the streets of the city. He cites the case of Davis v. The Mayor, etc., 14 N. Y. 506, wherein the Court of Appeals of that State held to be void any exclusive franchise of that character granted by the City of New York. He also cites Cooley's Const. Lim. (2d Ed.) 207, where it is said that "a corporation, having power under its charter to establish and regulate streets, cannot, under this authority, **without explicit legislative consent**, permit an individual to lay down a railway in one of its streets, and confer privileges exclusive in their character."

He continues:

"My conclusion, then, is that so much of the ordinance as purported to give exclusive privileges to the lessor of complainant was beyond the powers vested in the City of Kansas, and therefore void. It has no right, therefore, to challenge the validity of the ordinance giving defendant its privileges, or to restrain the defendant from building its road. Whatever of annoyance or inconvenience the latter's road may cause, passes among those consequential injuries which give no cause of action. It must suffer these just as the citizen who uses the street where its road is constructed suffers some

annoyance and inconvenience, and occasionally loss, and still without any action against it. Pro bono publico, all suffer somewhat."

The question was discussed in Saginaw Gas Co., v. City of Saginaw, 28 Fed. 529. It was there held that a clause in a municipal charter authorizing the city to cause its streets to be lighted did not confer the power to grant an exclusive privilege for a term of years.

It is there said:

"While there is great force in plaintiff's argument that individuals would not be likely to incur the great expense of establishing gas works and laying pipes without some assurance of a profitable and continued employment for a sufficient length of time to remunerate them for their outlay, we think the law is too well settled that this cannot be done, without express permission of the sovereign power, to be now disturbed. If a grant of this kind for thirty years may be supported, why may it not by parity of reasoning be upheld for a hundred years, or in perpetuity?"

The doctrine is well discussed in the case of Grand Rapids, etc., Co., vs. Grand Rapids, etc., Co., 33 Fed. 659. The charter conferred upon the city the right to make any ordinance desirable for lighting streets. It was held that such a power did not by implication authorize an ordinance granting the exclusive use of the streets for a term of years, and that such ordinance was ultra vires and void.

The Court of Appeals of New York gave full consideration to this subject in the case of In re Brooklyn, 143 N. Y. 596, 26 L. R. A. 270. Under the laws of New York a corporation desiring to engage in a public service was required to obtain the consent

of the municipality within which it was to operate, after which it might obtain its incorporation. Such consent was obtained from the village and the company duly incorporated. It was held that an exclusive privilege or franchise to supply water to the village was not given by mere general terms in a statute authorizing incorporation for that purpose, so as to preclude the municipality from obtaining water from other sources. By its contract with the village the water company had granted to it exclusive rights to purvey water during the ~~terms~~ time of the corporate charter. The court, after declaring that the charter should not be so construed as to grant to the company exclusive franchise, continues:

> "Chancellor Kent argued for the view that such grants or franchises might be so extended by implication as to give them due effect by excluding all contiguous competition which could be injurious through the creation of a rival franchise, or otherwise. But this doctrine did not prevail. It was distinctly overruled in Charles River Bridge case, 11 Pet. 648, 9 L. Ed. 824, the doctrine of which latter case this court has repeatedly followed in its decisions. (Citing cases).

This case was affirmed by the Supreme Court of the United States in Long Island Water Company v. Brooklyn, 166 U. S. 685, 41 L. Ed. 1165.

The same doctrine was reiterated by the United States Supreme Court as late as in the case of Stein v. Bienville Water Supply Company, 141 U. S. 67, 35 L. Ed. 622.

> "The legislature may not destroy or confiscate the property or franchise of a corporation; but it is not conceivable that the sovereign power can be restricted in its grants of corporate franchise within constitutional limits, save by its own express agreement, even though the mate-

rial consequence may be such as to entail loss, if not ruin, on existing corporations through rivalry and competition. Those are risks which if they cannot be guarded against are assumed by the grantee."

In Detroit, etc., Street Railway Co., v. Detroit etc., Co., 171 U. S. 48, 43 L. Ed. 67, the Street Railway Company was by the city ordinance, "exclusively authorized to construct and operate railways on certain streets of the city for a period of thirty years." The act of the legislature under which the Street Railway Company was organized, provided that all such companies "shall have the exclusive right to use and operate any railways constructed, owned or held by them." The city granted a franchise to another railway company. In considering the case the court said:

> "It is clear that the statute did not explicitly and directly confer the power on the municipality to grant an exclusive franchise to occupy its streets for railway purposes."
>
> "That such power must be given in language explicit and express, or necessarily to be implied from other powers, is now firmly fixed. There were many reasons which urged to this—reasons which flow from the nature of the municipal trust—even from the nature of the legislative trust, and those which, without the clearest intention explicitly declared insistently forbid that the future should be committed and bound by the conditions of the present time, and functions delegated for public purposes be paralyzed in their exercise by the existence of exclusive privileges."

The court declares the principle underlying its decision as follows:

> "A municipality is a governmental agency—

its functions are for the public good, and the powers given to it and to be exercised by it must be construed with reference to that good and to the distinctions which are recognized as important in the administration of public affairs.

Easements in the public streets for a limited time are different and have different consequences from those given in perpetuity. Those reserved from monopoly are different, and have different consequences from those fixed in monopoly. Consequently those given in perpetuity and in monopoly must have for their authority explicit permission; or, if inferred from other powers, it is not enough that the authority is convenient to them, but it must be indispensable to them."

In the case of Knoxville Water Company v. Knoxville, 200 U. S. 22; 50 L. Ed. 353, the Supreme Court reviews former cases on this point, and declares that it had never departed from the principles announced in the earlier cases, but had many times affirmed them. The Court further held that the principle of strict construction was equally applicable to municipal contracts and ordinances restricting the exercise of public powers.

The case of Water, etc., Co. v. Hutchinson, 207 U. S. 385, is closely in point. In that case the ultimate question was the validity of the city ordinance granting an exclusive right and privilege to supply the city with water, and with heat, light and power. The contract in its terms was exclusive, and was intended to be made so by the city. A subsequent grant to another company infringed upon the exclusive privilege of the first company. The case turned upon the legal right of the city to grant an exclusive privilege, even for a valuable consideration. The statutes of Kansas gave the city power to contract with private corporations for supplying the city with water and light, for a term not exceeding twenty-

one years. It was held that this did not include the power to make an exclusive contract, the court saying:

> "There are privileges which may exist in their full entirety in more than one person, and the privilege or franchise or right to supply the inhabitants of a city with light or water is of this kind. A grant of power to confer such privilege is not necessarily a grant of power to make it exclusive. To hold otherwise would impugn the cited cases and their reasoning. It would destroy the rule of strict construction. The foundation of that rule requires the grant of such power to be explicit—explicit in the letter of the grant—or, if inferred from other powers or purposes, to be not only convenient to them, but indispensable to them. And these conditions are imperative—too firm of authority to be disregarded upon the petition of equities, however strong."

Counsel for the Water Company relied upon the Walla Walla and the Vicksburg cases. The court after reviewing the cases of Citizens Railway v. Detroit, 171 U. S. 48, and Freeport Water Company v. Freeport, 180 U. S. 578, and affirming the principle of those cases that "the power of a municipal corporation to grant exclusive privilege must be conferred by explicit terms," distinguished the Walla Walla and Vicksburg cases as follows:

> "The doctrine was recognized as existing in Walla Walla v. Walla Walla Water Co., 172 U. S. 1, and in Vicksburg v. Waterworks Co., 202 U. S. 453. In the two latter cases the power of the respective cities to make a contract, precluding them from building waterworks and operating their own water systems, was declared. In the Vicksburg case it was pointed out that the power of the city to exclude itself from

building waterworks of its own was recognized to exist by the Supreme Court of Mississippi."

"In Vicksburg v. Vicksburg Waterworks Co., 206 U. S. 496, a contract of the city, fixing a maximum rate, was sustained upon the authority of the decisions of the Supreme Court of the State, holding that under a broad grant of power conferring without restriction or limitation upon the city, the right to make a contract for a supply of water, it was within the right of the city council, in the exercise of that power, to make a binding contract fixing the maximum rate at which the water should be supplied to the inhabitants of the city for a limited term of years."

In accordance with these principles and upon the authority cited, the Master properly concluded that "The City of Columbus at the date of the contract with the Columbus Water Works Company had no power to grant to said company an exclusive franchise for the construction and operation of a water works system, and any attempt on the part of the city to make such a grant was ultra vires." (Trans. p. 413).

With this conclusion of the Master the Circuit Court differed, and held that the city had the right to make and did make a contract conferring an exclusive privilege. (Trans. pps. 535-7). The Court rested his opinion on the assumption that the right to make the contract exclusive was a necessary and indispensable incident to the contract for a supply of water. The Court said that considering the size of the City of Columbus at the time no responsible parties would have entered into the contract for supplying water except for its exclusive character; since competition from other parties or the city would have destroyed the value of the franchise. Therefore in the opinion of the Court this case fell

within the principle of the Vicksburg case, 202 U. S. 453. (Trans. p. 534).

In so holding the Court fell into error, and as we think, misconstrued the opinion of this court in the Vicksburg case, and the reasoning upon which it was founded.

In the Hutchinson case, 207 U. S. 385, this court said:

> "In the Vicksburg case it was pointed out that the power of the city to exclude itself from building water works of its own was recognized to exist by the Supreme Court of Mississippi."

The real question was whether the contract which was by its terms exclusive, prevented the city from entering into competition with its grantee by the construction and operation of its own system. The court considered the meaning of the word "exclusive," and held that the city came within the definition.

The immediate question in the case at bar now under discussion concerns the power of the City of Columbus to make the contract, and not whether the city is by its terms excluded from constructing its municipal system. The case differs essentially from the Vicksburg case, in that no court in Georgia has held that an exclusive privilege of this character could be granted either by the State or by a municipality, since the constitution of 1877. In the Vicksburg case there was an express grant of power to the city to enter into a contract for a water supply; in the Columbus case this power is inferred from the general welfare clause of its charter; the Columbus case is in this respect controlled by the Hutchinson case 207 U. S. 385, and not by the Walla Walla case or the Vicksburg case.

Not only was the city without power to make an

exclusive grant, but this power could not have been conferred upon it. Even the legislature is prohibited by the Constitution and laws of Georgia from making irrevocable grants of special privileges or immunities.

The Constitution of Georgia, Article 1, Section 2, Paragraph 2, Code Sec. 5730, declares as follows:

> "No bill of attainder, ex post facto law, retroactive law, or law impairing the obligation of contracts or making irrevocable grants of special privileges or immunities shall be passed."

The Constitution of Alabama uses identically the same language with respect to such grants. Section 1 of Article 23 of that Constitution is as follows:

> "That no ex post facto law, or any law impairing the obligations of contracts or making any irrevocable grants of special privileges or immunities shall be passed by the General Assembly."

This section of that constitution has been construed and applied by the Supreme Court of Alabama in the case of Birmingham & P. Min. Ry Co. v. Birmingham St. Ry. Co., 79 Ala. 465, 58 Am. Rep. 615. The City of Birmingham had given what was in general terms an exclusive right to the plaintiff to construct a street railway along certain streets, and afterwards had given to the defendant the right to occupy the same street with a street railway. Considering the first grant by the city the court said:

> "What, it may be asked, is the nature of these special or exclusive privileges, which are thus prohibited to be granted by the legislature?
>
> It seems plain from the very terms used that the evil intended to be especially prevented was the granting of exclusive privileges in the nature

of a monopoly by the legislative creation of corporate franchises. Monopolies were void at the common law, and are not commonly conferred by legislative grant, and need no special prohibition in the organic law of a free republic."

"The policy of the law, as now declared by our Constitution, is as clear in the condemnation of the grant of irrevocable exclusive privileges conferred by franchise, as that of the common law was in the reprobation of pure monopolies which were always deemed odious, not only as being in contravention of common right, but as founded in the destruction of trade by the extinguishment of a free and healthy competition. Case of the Monopolies, 11 Coke, 84 b. The exclusive right of the appellee to the privilege claimed, in our opinion, cannot be sustained. The General Assembly would itself have no power under the Constitution to make such a grant."

This case was quoted from and cited with approval by the Supreme Court of the United States in Bienville Water Supply Co. v. Mobile, 186 U. S. 212, 46 L. Ed. 1132.

In Kidd, Dater Co., v. Musselman Gro. Co., 217 U. S. 461, it was declared that where this court has declared a State statute constitutional, it will follow that decision in a case involving the constitutionality of a statute of another State which fundamentally is similar, and which is attacked on the same grounds by persons similarly situated. The principle of that case applies here.

III.

The grant to the Water Company should not be construed to mean that the city would not enter into

competition with the Water Company during the contracted period.

A contract not to enter into competition with the grantee is the substantial equivalent of an exclusive franchise and requires the same authority to support it. As said by the Supreme Court in the Joplin case, 191 U. S. 150, "Others may not seek to compete with it (The Light Company) and if the city can not, the city is left with a useless potentiality, while the appellee exercises and enjoys a practically exclusive right." It seems to follow that if the city could not grant an exclusive franchise it was equally without power to so bind itself even by express contract as to accomplish substantially the same result.

It is now settled that no agreement can be implied that the city will not erect works of its own. No exclusive franchise having been given, the fact that the city contracted to take and pay for water for a term of years, does not give rise to an implied obligation that the city will not, within that term, construct its own system and enter into competition with the water company.

This question was directly presented and passed upon in the case of Joplin v. Southwest Missouri Light Co., 191 U. S. 150. The statute of Missouri provided that a city might erect and operate electric light or waterworks, or it might grant such right to any person or corporation upon such terms as might be prescribed by ordinance. The City of Joplin granted this right to a private corporation. Subsequently the city provided for the erection of its own system. The Circuit Court held that the city could not thus enter into competition with its grantee, and so to destroy or greatly impair the value of the franchise. 113 Fed. 817; 101 Fed. 23.

This court reversed the lower court, and held that no implied contract that the city will not during the term of the grant enter into competition, arises from a municipal grant of franchise to others, where such grant is not exclusive. The court said that the limitation contended for was upon a governmental

agency, and restraints upon that must not be readily implied; that such a limitation would give the light company a practical monopoly; and that the presumption is against the granting of exclusive rights, and against limitations upon the powers of government. The court cites Skaneateles Water Works Co. v. Skaneateles, 184 U. S. 354; 46 L. Ed. 585, and Bienville Water Supply Co. v. Mobile, 175 U. S. 109, 44 L. Ed. 92, to sustain its conclusion, and declares that there is nothing inconsistent in the Walla Walla case. Referring to that case the Court pointed out that the city of Walla Walla had expressly and explicitly contracted with the water company that during the life of the contract it would not erect, maintain or become interested in any other water works; that the power of the city to make such contract was sustained and was in force at the time the suit was brought; and that the water company had substantially complied with all of its terms and conditions.

In the Skaneateles case the contention was that as the village had the election of constructing its own waterworks or of conferring such power upon a private corporation, and having elected the latter it impliedly contracted not to erect works of its own.

In reply to this contention the court said, by Mr. Justice Peckham:

> "There is no implied contract in an ordinary grant of a franchise, such as this, that the grantor will never do any act by which the value of the franchise granted may in the future be reduced. Such a contract would be altogether too far-reaching and important in its possible consequences in the way of limitation of the powers of a municipality, even in matters not immediately connected with water, to be left to implication. We think none such arises from the facts detailed."

In the Bienville case the City of Mobile had contracted for water from the company for a term that had not expired. Under authority from the legislature the city was proceeding to construct its own system of waterworks. The Water Company contended that the city had no legal right to impair the value of its plant and to destroy or diminish the income therefrom by entering into competition with it. The Supreme Court dismissed the contention as being unfounded.

The Master recognized the correctness of this position and accordingly held, "That where an existing contract between the municipality and another in which the grant of a franchise or privilege for the performance of a public duty is not explicitly and expressly set out, there can be no implication as to what was the intention of the parties." (~~M. B.~~ 108). The Master concludes that the doctrine is that it is not permissible to read into such a contract what does not clearly appear as embodied therein in explicit terms.

The question then presented is whether the agreement that "The Mayor and Council are to grant to the contracting parties a **franchise** for **the exclusive privilege** of operating and maintaining the works" clearly and explicitly expresses the agreement that the city will not during the contractual period construct and operate its own system of waterworks. The express agreement is that the city will grant an exclusive franchise. This, as has been shown, the city was without power to do. There is certainly no express agreement that the city would not construct works of its own. If such an agreement is an incident of the principal undertaking it must arise by implication. Not only are such implied agreements forbidden, but as the principal undertaking (the granting of an exclusive franchise) was void, the incident must necessarily fall with it.

IV.

Had the City been vested with authority from the legislature to grant an exclusive privilege, and had in fact done so, it would have been subject to the reserved right of revocation; and the act of the legislature in conferring upon the city the right to erect and maintain its own system of waterworks would operate as a revocation of any prior exclusive grant.

The case of Bienville Water Supply Co. v. Mobile, 185 U. S. 212, 46 L. Ed. 1132, is closely in point, if not indeed conclusive of the proposition.

The charter of the water company gave it the exclusive right of supplying water to the city, and county of Mobile for a term of twenty years, and until the purchase of the plant by the city, reserving, however, the right to permit the future organization of any company for the purpose of supplying the city with water which should not interfere with the property rights of the Bienville Company. The city contracted with the Bienville Company for water for a term which had not expired. Afterwards, but before the expiration of the contract term, the legislature conferred upon the city the right to erect its own water system, and amended the charter of the Bienville Company by striking therefrom the word "exclusive," thus depriving the grant of its exclusive character. The city was proceeding to erect its system, when the water company sought to enjoin it. The court after stating that obviously the Alabama Constitution intended that the legislature should have the right of revocation, and that whoever took a charter should take it subject to that right, declared that the exercise of the right was not limited to cases where no injustice would thereby be done to the corporators. Speaking by Mr. Justice Brewer, the court said:

> "But the grant of a monopoly is forbidden by the Alabama Constitution. As said by its Supreme Court in the quotation just made: 'The

General Assembly would itself have no power under the Constitution to make such a grant.'

By a separate section of the Constitution it affirmatively declared that the legislature shall pass no act 'making an irrevocable grant of special privileges or immunities.' While that body may grant special privileges and immunities, grant franchise to build waterworks, construct railways, or other works of public utility, and by a failure to duplicate a grant make it in effect for the time being exclusive, yet no one legislature can forestall action by succeeding legislature, or bind the State by making the grant in terms exclusive. As much force and effect must be given to section 23 as to any other, and it was obviously the intent that, even if exclusive privileges were granted, the monopoly feature thereof should always be subject to revocation. In this section there is no suggestion of amendment or alteration. That which is distinctly provided is the absolute power of revocation. To hold that the exclusive feature of plaintiff's grant could not be revoked because thereby injustice might be done to the corporators is simply to nullify section 23."

All charters obtained in Georgia since the constitution of 1877 are taken subject to the reserved right of amendment or repeal. Inasmuch as the legislature is forbidden to grant irrevocable special privileges or immunities, it would seem that the provision forbidding the revocation of special privileges and immunities, except in such manner as to work no injustice to corporators or creditors (Code Section 5731), refers only to such as had been granted prior to the constitution. However that may be, the Birmingham and Bienville cases are controlling on this point.

In the Vicksburg case the contract was entered into prior to the adoption of the constitution reserv-

ing the right of revocation. In such a case it may well be that upon withdrawing a right that had been lawfully granted, just compensation should be paid. The language of the court on this point cannot prevail against the ex cathedra declaration in the Bienville case.

The right of the State to revoke grants to corporations is expressly recognized by the Supreme Court of Georgia in Macon & Birmingham R. Co., v. Gibson, 85 Ga. 1; and in response to the contention that the rights of third parties would be affected the court said that all parties contracting with a corporation must take notice of the conditions on which it holds its franchise and of its subjection to the legislative will.

A very similar constitutional provision of the State of Ohio has been passed upon by the Supreme Court of the United States in the case of Hamilton Gas Light & Coke Co., v. City of Hamilton, 146 U. S. 258, 36 L. Ed. 963.

A statute of the State of Ohio gave to cities the right to contract with gas companies for city lighting. The City of Hamilton, by ordinance, gave the gas company "the exclusive privilege of laying pipes for carrying gas in said city, and of putting up pipes in dwellings in connection with the street pipes for the term of twenty years." Subsequently the city passed a resolution declaring that it no longer desired the company to furnish gas for public lighting, and notifying the company to remove its mains and posts from the streets. The city passed an ordinance looking to the issuing—such issuing being first approved by the popular vote—of bonds for the purpose of itself erecting works to supply the city and its inhabitants with gas. It also appeared that the city was authorized by the legislature to erect works of its own. Suit was thereupon instituted by the gas

company against the city to enjoin it from issuing bonds and from erecting gas works of its own.

The court said:

> "It may be that the stockholders of the plaintiff supposed at the time it became incorporated, and when they made their original investment, that the city would never do what evidently is contemplated by the ordinance of 1889. And it may be that the erection and maintenance of gas works by the city at the public expense, and in competition with the plaintiff, will ultimately impair, if not destroy, the value of the plaintiff's works for the purpose for which they were established. But such consideration cannot control the determination of the legal rights of the parties. As said by the court in Curtis v. Whitney, 80 U. S. 513; 13 Wall 68, 70: 'Nor does every statute which affects the value of a contract impair its obligation. It is one of the contingencies to which the parties look now in making a large class of contracts, that they may be affected in many ways by State and national legislation.' If parties wish to guard against contingencies of that kind they must do so by such clear and explicit language as will take their contracts out of the established rule that public grants, susceptible of two constructions, must receive the one most favorable to the public."

The Constitution of Ohio contains a clause similar to that in force in this State, which provided that "no special privileges or immunities shall ever be granted that may not be altered, revoked or repealed by the General Assembly."

Discussing the effect of this clause on a franchise, exclusive by its terms, the court said:

> "If the statute under which the plaintiff became incorporated be construed as giving it the exclusive privilege, so long as it met the requirements of the law, of supplying gas light to the city of Hamilton and its inhabitants by means of pipes laid in public ways, there is no escape from the conclusion that such a grant as respects, at least, its exclusive character, was subject to the power of the legislature, reserved by the State Constitution, or altering or revoking it. This reservation of power to alter or revoke a grant of special privileges necessarily became a part of the charter of every corporation formed under the general statute providing for the formation of corporations. A legislative grant to a corporation of special privileges, if not forbidden by the Constitution, may be a contract; but where one of the conditions of the grant is that the legislature may alter or revoke it, a law altering or revoking, or which has the effect to alter or revoke, the exclusive character of such privileges, cannot be regarded as one impairing the obligation of the contract, whatever may be the motive of the legislature, or however harshly such legislation may operate, in the particular case upon the corporation or parties affected by it."

There is nothing in the case of Walla Walla v. Walla Walla Water Co., 172 U. S. 1, that conflicts with or qualifies the proposition that the city cannot, in the absence of express authority, grant an exclusive privilege or franchise. In the opinion it is said that a grant of a right to a water company to use the streets of the city is a franchise granted on consideration of a public service, and after performance by the grantee is a contract protected by the Constitution of the United States "provided the right to do so is given by their charter." The City of Walla Walla was expressly authorized to grant the franchise for the term involved in that case. The

court further said that it was immaterial in so far as concerned the jurisdiction predicated upon a federal question whether the city contracted in its sovereign or proprietary capacity "provided the right to make such contract was conferred by the charter."

The court continues:

> "As the contract in question was expressly limited to twenty-five years and as no attempt was made to grant an exclusive privilege to the Water Company, the city seems to have acted within the strictest limitations of the charter. Atlantic City Waterworks v. Atlantic City, 48 N. J. L. 378.
>
> "Had the privilege granted been an exclusive one, the contract might be considered objectionable upon the ground that it created a monopoly without an express sanction of the legislature to that effect."

The court further said that the granting of such a franchise not exclusive, for a term of years, "does not, in our opinion, create a monopoly or prevent the granting of a similar franchise to another company." It is further to be observed that the City of Walla Walla expressly contracted that it would not erect waterworks of its own during the life of the contract.

V.

Under the decisions of the Supreme Court of Georgia the contract created a debt forbidden by the Constitution of the State and was therefore void.

The Supreme Court of Georgia has unequivocally held that contracts of this character constitute the creation of an indebtedness within the inhibition of the State Constitution. Cartersville Improvement Co., vs. Cartersville, 89th Ga. 683. Cartersville Water Co. vs. Cartersville, 89th Ga. 689. City of

Dawson vs. Dawson Water Works Co., 106th Ga. 696.

One of the counsel for the City of Columbus was the Master making the report in the case of Columbia Avenue Trust Co., vs. City of Dawson, et al., 130th Fed. 162, in which he held that in a controversy between the holders of the bonds of the Water Company and the city, issued prior to the decisions of the State Court above cited, the Federal Circuit Court was not bound to follow such decisions of the State Court, but would be controlled by the decision of the Supreme Court of the United States in the Walla Walla case, holding that such a contract did not create a debt. His opinion is unchanged, but this point is submitted in deference to associate associate counsel.

VI.

Even if the contract was in all respects valid and binding the city has been absolved from its obligations thereunder by reason of the failures and defaults on the part of the Water Company.

The Master found that the Water Company had failed to comply, and was unable to comply with its contract, with the city in the following particulars, among others:

1. Section X of the contract provided that the source of supply should be determined by White, he guaranteeing, however, that the supply of water, both in quality and amount, should be wholesome, constant, and amply sufficient to meet the wants of the city and private consumers for present and future requirements. The Master found that this requirement had not been complied with. The water was often foul and filled with mud and other matter. This was notably so in 1902, both in the reservoir water and the river water, when resort was had to the

river. On this point the finding of the Master was as follows:

> "With reference to the supply of water, I find that the company has failed to comply with Sections I and X (of the contract) in that a sufficient supply of wholesome, constant and ample water has not and cannot be furnished from the source of supply as selected, nor is the same sufficient to meet the wants of the city and private consumers for present and future requirements." (Trans. p. 407).

The Master further said:

> "The water from the reservoir was totally unfit for use in July, 1902. The citizens had to resort to old wells and cisterns, and the purchase of water from the owners of springs outside the city. When the river water was turned into the mains, in 1902, it was used in some instances after filtering and boiling. The intake of this water by the Company was along the river bank adjoining the factory districts. It was largely contaminated by sewerage from the city. This water unfiltered is very muddy and foul."

2. The distribution system was inadequate, and was not so extended and improved as to meet the growing needs of the city and private consumers, nor was the fire pressure maintained as required by the contract. The Master found in this regard as follows:

> "I find that the company has failed to comply with Section V. of the contract in not connecting together the ends of its system, and placing mains sufficiently large to at all times give full supply of water." (Trans. p. 407).

The Master further found:

> "Up to the time the reservoir failed entirely in 1902, the company claimed that there was ample water in the reservoir, but that the supply main was of insufficient size. The true cause was that the increase of the use of water had decreased the pressure, and it was evident that in 1902 the main was too small to supply the city with pressure and water." (Trans. p. —).

The Master further declared: 389

> "That the company has failed to supply the city with water under the terms of the contract is abundantly shown by the evidence, and this is especially true since July, 1902, and as hereinbefore referred to it has admitted its inability and placed the responsibility of further undertaking to carry out the contract upon the holders of the bonds of the company."

The court said as to the Master's finding that there was a failure to furnish an abundant supply of pure and wholesome water the facts in evidence before him justified his finding, particularly as to September, 1902. (Trans. p. 537).

The court further said:

> "In my judgment the facts in evidence were sufficient to justify the Master in finding that there was a failure on the part of the Company to furnish a sufficient supply of pure and wholesome water as provided in the contract, and finding the company had failed in this respect. * * * * * * Taking this whole record together, and considering all the evidence, the Master, as above stated, was justified in reaching the conclusion that there was a failure to comply with the contract in this respect."

VII.

Under conditions existing at the time, the city not only had the right, but was under the imperative duty in the exercise of its police power to make provision for an adequate supply of wholesome water.

The water furnished was impure and deleterious to the health of the citizens. It was offensive in taste and smell, and had been condemned by the State Chemist and the City Board of Health. It was unfit for domestic purposes, and the citizens were forced to purchase water for drinking and culinary purposes from supplies brought in from neighboring springs. Its color and odor were such as to render the idea of a bath in it repellant. To provide against these evils was clearly within the police power of the city. The quantity furnished and the pressure afforded were insufficient to furnish protection against fire. For the purpose of preserving the health and of protecting the property of the citizens against loss or damage by fire, the city was under the high obligation of seeking relief.

The Master found as follows:

> "Under conditions existing at the time of the passage of the ordinance in September, 1902, and at the time of its practically unanimous ratification in December thereafter, and for a long period thereto, it was evident that the water company was not only unable to do so, but had failed to supply the needs of the city. The water was impure and deleterious to the public health, and had been condemned both by the Board of Public Health, and by chemists called to analyze it. The citizens were forced to purchase water for domestic use, and the fire protection was uncertain. In these conditions the city was justified in taking steps to provide a different and adequate system of water works

and in the exercise of its police power had a legal right to do this." (M. R. 115-116).

In these conditions the abrogation of the contract with the Water Company, if it be an abrogation, to the extent of providing for a new and adequate system of waterworks was strictly within the legal rights of the city in the exercise of its police power, in no way violative of the contract clause of the Federal Constitution.

The Supreme Court says in Walla Walla vs. Walla Walla Water Company, 172 U. S. 1, 43 L. Ed. 341, 347:

> "If a contract be objectionable itself upon these grounds, or if it becomes so in its execution the municipality may, in the exercise of its police power, regulate the manner in which it may be carried out, or may abrogate it entirely, upon the principle that it cannot bind itself to any course of action which shall prove deleterious to the health or morals of its inhabitants. In such case an appeal to the contract clause of the Constitution is ineffectual."

Mr. Justice Bradley speaking for the Court in Boston Beer Co. v. Massachusetts, 97 U. S. 28, 24 L. Ed. 989, says:

> "Whatever differences of opinion may exist as to the extent and boundaries of the police power, and however difficult it may be to render a satisfactory definition of it, there seems to be no doubt that it does extend to the protection of the lives, health and property of the citizens, and to the preservation of good order and the public morals. The legislature cannot, by any contract, divest itself of the power to provide for these objects. They belong emphatically to that class of objects which demand the ap-

plication of the maxim "salus populi suprema lex", and they are to be attained and provided for by such appropriate means as the legislature may devise. That discretion can no more be bargained away than the power itself."

In Butchers Union Co. v. Crescent City Co., 111 U. S. 746, 28 L. Ed. 585, the legislature of Louisiana had granted the Crescent City Company an exclusive right to slaughter cattle in the City of New Orleans; that this right was exclusive has been determined in the Slaughter House cases, 16 Wall. 86, 21 Ld. Ed. 394, and it was further held that the State had the constitutional right to grant the exclusive franchise creating the monopoly.

In the Butchers Union case it was said that the Crescent City Company had expended a very large amount of money on the faith of the privilege, and that the transaction presented all the elements of a contract on sufficient consideration; and it was further said that an ordinance of the City of New Orleans granting the right to slaughter cattle to others impaired the supposed obligation of the contract by taking away the exclusive right of the company granted to it for twenty-five years, which constituted the most valuable thing supposed to be secured by statutory contract. The court held that the ordinance was a proper exercise of that well known but undefined power called the police power, so indispensable to the public welfare that it cannot be bargained away by contract.

The Court speaking through Mr. Justice Miller forcibly declares:

"While we are not prepared to say that the legislature can make valid contracts on no subject embraced in the largest definition of the police power, we think that, in regard to two subjects so embraced, it cannot, by any contract, limit the exercise of those powers to the

prejudice of the general welfare. These are the public health and public morals. The preservation of these is so necessary to the best interests of social organization that a wise policy forbids a legislative body to divest itself of the power to enact laws for the preservation of health and the repression of crime."

In this exercise of the police power of the city there was no injustice to the stockholders of the Water Company. In the case of Northern Pacific Railway Company v. Duluth, 208 U. S. 583, the question involved was the right of the city to so exercise its police power as to conflict with a prior contract.

In 1871 the City of Duluth laid out a public street across the tracks of the railway company. In 1891 traffic and travel in the street had become so great that the constant passage of cars and engines endangered the public safety. The city demanded that the railway company should construct, at its own expense, a viaduct over the street. The railway company, while denying its obligation, entered into a contract with the city by which the railway company would contribute $50,000 to the building of the viaduct, and the city agreed that it would for fifteen years maintain that portion of the viaduct over the railroad's right of way, and would perpetually maintain the approaches without expense to the railway company. In 1903 the viaduct and its approaches having become dangerous to public safety, the city called upon the railway company to make the necessary repairs at its own expense. The railway company pleaded the contract; and that the municipal ordinance in question was in violation of the obligation of this contract. The court agreed that the obligation of the contract would be violated by the ordinance, unless the action of the city was justified in the exercise of the police power. The court held that the action was so justified, and that as a municipality cannot contract against the exercise of its police power, the subsequent exercise of such power,

while it may be inconsistent with the contract, does not violate its obligation. The court said:

> "There can be no question as to the attitude of this court upon this question, as it has been uniformly held that the right to exercise the police power is a continuing one; that it cannot be contracted away, and that a requirement that a company or individual comply with reasonable police regulations without compensation is the legitimate exercise of the power and not in violation of the constitutional inhibition against the impairment of the obligation of contracts."

After referring to and discussing previous cases the court concluded:

> "The result of these cases is to establish the doctrine of this court to be that the exercise of the police power in the interest of public health and safety is to be maintained unhampered by contracts in private interests, and that uncompensated obedience to laws passed in its exercise is not violative of property rights protected by the Federal Constitution."

The ordinance of the City of Columbus providing for submission of the question whether bonds should be issued for the purpose of constructing new waterworks declared in express terms the underlying reason to be that "the Columbus Water Works Company has totally failed to supply the City of Columbus and its inhabitants with a sufficient quantity of pure and wholesome water"; and that "the public health of the City of Columbus is paramount in importance to every other consideration." It is thus apparent that in adopting this ordinance and in making provision for new waterworks the city proceeded in the exercise of its police power.

VIII.

The opinion and order of the court that ~~construction~~ decree in favor of the city should be made conditional upon the purchase of any part of the present water system is not founded upon the pleadings, and is beyond the jurisdiction of the court, as being in violation of the right of private contract.

The order and decree of the court that any portion of the present water system could be made available by the city in connection with its proposed system, and in providing for its purchase by the city at a price to be fixed either by arbitration, or on the report of experts, is not based upon the pleadings; is not supported by the evidence, and is beyond the jurisdiction of the court.

It is familiar law that the decree must conform to the pleadings, and the issues raised thereby. There is no contention in this case that the city is under any obligation to purchase the old system or any part of it. No evidence offered by either party was directed to this point. The question was not discussed by counsel in argument before the Master. The finding of the Master in this regard, and the decree of the court thereon, are foreign to the case, and should not be allowed to stand.

The original bill set up a contract with the city, and averred that the city in proceeding to erect its own system of waterworks was violating the obligation of that contract, and was taking the property of the Water Company without due process of law. There was no claim that the bondholders had any equity which would entitle them to demand from the city payment for the water system, or any part thereof, nor any facts alleged upon which such contention could be founded. The prayers were for specific performance and for injunction. In its cross bill the city sought to have the contract annulled

and set aside because of non-performance on the part of the Water Company. No such decree as that recommended by the Master can be entered in conformity with these pleadings. The Master has found that the Water Company failed in the performance of the obligations assumed under the contract and because of this non-performance the city was relieved from its reciprocal obligation, and was entitled to have the contract set aside, and to proceed with the erection of its own system. Under these findings the city is entitled as a matter of right to a decree in its favor granting the relief sought.

In a suit in equity when the complainant is entitled to and is awarded the relief prayed for in his bill, it is error to require as a condition precedent to the enforcement of the decree that he pay a sum found by the Master to be due the defendant when the facts upon which such finding is based are not pleaded. Burke v. Davis, 81 Fed. 907.

When under the law and facts of the case the defendant is entitled to a decree dismissing the bill the complainant cannot insist that the bill should have been retained for the purpose of granting him relief not prayed for and inconsistent with the theory upon which the suit was brought. Rejall v. Greenhood, 92 Fed. 945.

The inconvenience or loss to the bondholders which may result from the decree to which the city is entitled cannot be considered by the court.

The well considered case of Woodruff v. Gravel Co., 18 Fed. 753, is authority to the proposition that the only duty of the court is to grant the relief to which the party is entitled under the law and facts of the case; and that it is beyond the province of the court to consider or suggest any mode by which the party may avoid the injurious consequences of his own acts, or to decide upon the opinion of experts

concerning the feasibility or sufficiency of such suggested mode. The court said:

> "We are simply to determine whether the complainant's rights have been infringed, and if so afford him such relief as the law entitled him to receive, whatever the consequences resulting to the wrong-doers or the general public may be. It is the province and imperative duty of the court to ascertain and enforce the legal rights of the complainant no matter what the consequences to the defendant may be."

The court cites Attorney General v. Council of Birmingham, 4 Kay & J. 539, wherein the Vice Chancellor declared:

> "I am not sitting here as a committee of public safety armed with arbitrary power to prevent what it is said will be a great injury not only to Birmingham but to all England; that is not my function."

It is not within the province of either the Master or the court to disregard the pleadings and deny to one of the parties the relief to which he is entitled, because the consequences might entail great loss upon the other party, even though it may appear that the prevailing party by a purchase of the subject-matter of the suit could to that extent relieve against the apparent hardship. As said by the Supreme Court of California in Weaver v. Ureka Lake Co., 15 Cal. 274, "a comparison of the value of conflicting rights would be a most novel mode of determining their superiority."

In Hamilton Gas Light & Coke Co. vs. City of Hamilton, 146 U. S. 258, 36 L. Ed. 963, the sourt said:

> "It may be that the erection and maintenance of gas works by the city in competition with the

plaintiff will ultimately impair, if not destroy, the value of the plaintiff's works for the purpose for which they were established, but such consideration could not control the legal rights of the parties."

The Court of Appeals of New York declared that while the legislature may not destroy or confiscate property it cannot be restricted in its grant of corporate franchises "even though the material consequences may be such as to entail loss if not ruin on existing corporations through rivalry and competition." In re Brooklyn, 143 N. Y. 596; 166 U. S. 681; 41 L. Ed. 765.

It is only when the relief sought is discretionary that the court may impose conditions. If the party stands upon his rights and asks no favors he need grant none. In cases where the relief sought is discretionary with the court, as in specific performance, or the appointment of a receiver in aid of foreclosure, the granting of such relief may be made upon the requirement that the party making it shall submit to equitable terms. If he asks such relief he may be required to give effect to equities existing in favor of the other party arising out of the contract. If he does not choose to accept the relief upon such terms he may refuse it and proceed to enforce all of the rights to which he is entitled. So where the holder of a mortgage upon railroad property asks for the appointment of a receiver, and for subjection of current income to his claim, the court may impose the condition that pre-existing current debts shall first be paid from current income. On this point Fosdick v. Schall, 99 U. S. 235, 25 L. Ed. 339, is the leading case. It was there said that by making the relief so conditional the court will only do what, if a receiver should not be appointed, the company itself ought to do; and even though the mortgage may in terms give a lien upon the income, until possession is actually taken

the whole earnings belong to the company, and are subject to its control. Speaking through the Chief Justice, the court said:

> "The mortgagee has his strict rights which he may enforce in the ordinary way. If he asks no favors he need grant none. But if he calls upon a court of chancery to put forth its extraordinary powers and grant him purely equitable relief, he may with propriety be required to submit to the operation of a rule which applies in such cases, and do equity in order to get equity. The appointment of a receiver is not a matter of strict right. Such an application always calls for the exercise of judicial discretion; and the Chancellor should so mould his order that while favoring one, injustice is not done to the other. If this can not be accomplished, the application should be ordinarily denied."

This right of the Chancellor to grant discretionary relief on conditions is subject to well defined rules. In Kneeland vs. American Loan & Trust Co., 136 U. S. 89, 34 L. Ed. 379, the court repudiated the idea that the appointment of a receiver could be made conditional upon the payment of any claims other than those favored with a superior equity, and said:

> "Can anything be conceived which more thoroughly destroys the sacredness of contract obligations? * * * So when the court appoints a receiver of railroad property it has no right to make that receivership conditional upon the payment of other than those few unsecured claims which by the ruling of this court have been declared to have an equitable priority."

In any case, therefore, even where the relief is discretionary, before the decree can be made conditional it must plainly appear that the party in

whose favor the condition operates is possessed of a superior equity. It is only in such cases that the doctrine "he who seeks equity must do equity," can apply. Under the facts as found by the Master and under the law applicable thereto, the bondholders have no such equity. The rights of the parties have been adjudicated, and it has been found that the city is entitled to the relief it seeks, and that the complainant is not entitled to the relief sought for by it. The Water Company having failed, and being unable to perform the obligation of its contract, must suffer the legal consequences of its own wrong and incapacity. It could not be said that the Water Company has any equity as against the city. The Master has found that the bondholders have no superior legal rights to those of the Water Company, and in this finding the court has concurred. He has found that the bonds were purchased with full notice of the fact that the property was bonded for an amount greatly in excess of its value, and with notice of the obligations imposed upon the Water Company by its contract with the city. No representations were made or assurances given by the city to the purchasers of the bonds. The Master, therefore, properly concludes that the purchasers "assumed the risk of the investment and their legal rights are no higher than those of the Water Company," and yet the Master thinks that "there may be an equity in their favor."

An analysis of the report discloses that the Master bases this supposed equity upon the fact that in the contract the city was given the privilege of purchasing the works. The reasoning of the Master is as follows: "The city contracted for the privilege of purchasing the system, and while I have found this not to be a binding obligation of purchase it may in equity be enforced to the extent of requiring the purchase of such part of the system as the city may now use." In other words, because the city did not see fit to avail itself of the mere option, the creditor

of the Water Company has an equity in requiring the city to exercise the option to the extent of purchasing a part of the property. It was not contended that the city was under obligations to purchase the system or any part thereof, and the mere fact that it had an option to do so gives no equity to the other party if it refuses to exercise such option.

Farmers Loan & Trust Co., vs. Galesburg, 133 U. S. 156, 33 L. Ed. 573, furnishes ~~the~~ authority for the recommendation of the Master but is direct authority to the contrary. In that case the city contracted to sell the water mains belonging to it to a new company which undertook to furnish water to the city, and its inhabitants, in accordance with certain requirements. The Water Company failed to comply with its contract, in consequence of which the city retook its mains, declared the contract at an end, and brought its suit to have the contract judicially set aside. The trustee of the bondholders was made a party to the suit. The mortgage securing the bonds issued by the Water Company was foreclosed and the bondholders became the purchasers. The city had made no payment for the water furnished by the company, and actually used by the city. The Circuit Court directed a reference to the Master to ascertain the fair value of the water furnished to the city and decreed that when the city should pay into court for the bondholders committee the amount so ascertained, a decree would be entered annulling the contract and establishing the city's title to the old mains. The Master exceeded the warrant of the reference, and after finding the facts in favor of the city added the recommendation that the decree cancelling the franchise should be conditional upon the city paying into court for the use of the bondholders the reasonable cash value of the mains and systems constructed by the Water Company. This recommendation of the Master was not only disregarded without comment, but the opinion of the Supreme Court is direct and clear to the point that the city was justified in declaring the contract at an end, and

in retaking its mains, and was entitled to an unconditional decree setting aside the contract. This case is also instructive as to the rights of the bondholders. The opinion is to the effect that the bondholders had no equity or rights superior to those of the Water Company.

To require the city to purchase any part of the present system would distinctly violate the liberty of private contract. It is unnecessary to argue or cite authorities to the proposition that liberty of contract is one of those high constitutional rights which should be preserved inviolable. Civilized society could not exist unless persons were secure in their right to acquire, enjoy and dispose of property. The functions of courts with respect to contracts are limited to preserving and enforcing their obligations. It is beyond the province of the Judiciary to make contracts for parties or force them to purchase property against their will. In a case like this under discussion, all that the court is called upon to do is to determine what the contract means and to strictly preserve and enforce its obligation. Whether the city could advantageously use any portion of the present system is not a judicial question, but is a matter solely for the consideration of the parties concerned. It is too clear for argument that no person can be deprived of his property for the benefit of another private person, even though just compensation be rendered. It is only where the rights of the public are concerned that the doctrine of eminent domain can be invoked and private property taken for public use. If the court can force the city to purchase any part of the present system at a price to be fixed by the court in order that the bondholders may be relieved against loss, the court will have assumed and exercised the universally forbidden power of taking private property for private use and benefit.

The trial Judge in his opinion was impressed with

the thought that inasmuch as the receiver of the court had improved the service, and the bondholders had offered to consent that the income should be applied in betterments to the property in order to further improve the service, this created some sort of an equity in the bondholders to insist on the performance of the contract. He further thought that the fact that the city had continued to receive and pay for the water had imposed upon it an obligation to protect the interest of the bondholders.

We respectfully submit that the bondholders of the Water Company can have acquired no equity as against the city by reason of what may have occurred subsequent to the adoption by the City of Columbus of the ordinance declaring the failure of the Water Company to comply with its contract. These subsequent occurring events, so far as they are material to this inquiry, may be summarized as follows:

First. In December, 1902, the bondholders filed their bill alleging the non-performance by the Water Company of its contract with the city, and the inability of the Company to carry out the contract; and at their instance a receiver was appointed by the court.

Second. The court with the consent of the bondholders issued receiver's certificates, and used the proceeds in the betterment of the property with the result that the service and quality of the water was materially improved.

Third. The bondholders by a so-called amendment offered to consent to the further use of the income from the property in making such additional improvements as the court might direct in order to enable the receiver to fully comply with the requirements of the contract between the Water Company and the city.

Fourth. The city has since continuously accepted and paid for the water furnished by the receiver at the old contract rate.

The question is whether these facts invest the bondholders with an equity superior to the legal rights of the city. We think it has been shown in this brief that as against the Water Company there could be no doubt of the right of the city to a rescission of the contract on the ground of the failure of the Water Company to comply with the requirements; and the Master so found. At the time of the breach of the contract by the Water Company, and at the time of the adoption by the city of the ordinance in question there could be no doubt that the bondholders had no higher rights against the city than did the Water Company. Unless therefore the city has done or omitted to do some act that would operate as an estoppel against it, the position of the bondholders is no better now than it was then.

There is no contractual relation or privity of contract between the city and the bondholders; so far as the city is concerned they are mere volunteers seeking to protect their own interests, and to preserve the value of their security. The fact that the bondholders have expended money in protecting the value of their security can not impose any obligation upon the city. None of the acts on the part of the bondholders or the receiver was at the instance or by the consent of the city which was constantly and vigorously protesting that its right to construct its own system of water works should not be interfered with. The city asked no favors nor encouraged any expenditures, but stood upon its legal rights. It is true that the city has used and paid for the water furnished by the receiver; but what else could it do? Its hands were tied by the injunction of the court so that it could not provide another source of supply; and the use of the water for fire protection and sanitary purposes was imperactive. That the city has paid for the water used certainly creates no equity against it; it should not be punished for its honesty in paying for what it received.

The bondholders have received the benefit of the expenditures made both in the enhanced value of their property, and also in the increased income which the receiver's reports show yields handsome returns upon the value of the investment. For more than seven years the bondholders have enjoyed this income, either applying it to the betterment of the property or in some other way for their own benefit. The contract by its terms has little more than one year to run; and without any fault or delay attributable to counsel or the court the litigation may be prolonged over this unexpired term or a great part thereof. During all of these years the city has had its hands tied by the injunction, and has been forced to submit to the service provided, whether good or bad. How is the city to be compensated for its loss accruing from this long litigation, which while **damnum absque injuria** is none the less real? If the city had the legal right to a rescission of the contract as against the Water Company, in what does the superior equity of the bondholders consist? As was said in the Galesburg case (Farmers Loan & Trust Company vs. City of Galesburg, 133 U. S. 159):

> "Although the bondholders exercised good faith in purchasing the bonds, they bought them knowing that the city was not a party to them, and that the payment of water rents by the city for the hydrants depended upon a continued compliance by the Water Company with the terms of the contract. * * * * * * * * * * * The liability of the city to pay in future the hydrant rents depended upon the future compliance of the Water Company with its contract; and in case of its failure the city would have the right to ask for the rescission of the contract.
>
> This the bondholders knew when they purchased the bonds. The city entered into no contract with them, and the passage of the resolution of December 6, 1883 (accepting the water works as satisfactory) could not deprive the city

of the relief to which it would otherwise be entitled, on the failure of the Water Company to comply with its contract."

The court further said that the bondholders were bound to take notice of the contents of the ordinance authorizing the construction of the water system before purchasing their bonds, which were purchased and held subject to the continued compliance of the Water Company with the terms of the ordinance.

The bonds were bought as obligations of the Water Company, and not as evidence of indebtedness of the city; and the ordinance put them upon notice "that if the Water Company neglected to comply with its contract the city would have the right to invoke the aid of a court of equity to enforce a cancellation of the contract." In this case it is clearly held that the bondholders have no higher rights or superior equity than the Water Company.

CONCLUSION.

The Master having found and concluded that because of the breaches, failures, and defaults of the Water Company, and its confessed inability to perform the contract, the city was released from its reciprocal obligations; and the Master having further found that the existing conditions at the time justified the city in proceeding to construct a municipal system; and this finding of the Master having been approved by the court; we think the only vital question left in the case concerns the right of the court to impose terms upon the city as conditions precedent to a decree in its favor.

For the sake of this argument it may be conceded that an exclusive franchise or privilege had been lawfully granted by the city to the Water Company for an unexpired term; nevertheless the city had the right to seek relief from the distressing conditions then existing. In so doing the city in no way violated the obligation of the contract. If the city had

the right to refuse further performance because of the defaults and inability of the other contracting party; and if the city was justified in the exercise of its police power to provide for a system that would supply the needs of the city and its inhabitants; its action in these regards, being a lawful execution of its municipal trust, could not operate as a violation of the obligation of the contract.

If the established facts of the case, and the law applicable thereto as approved by the court, make it clearly manifest that there has been no violation of the obligation of the contract, then there is no longer any federal question in the case.

There is no such diversity of citizenship as will support the jurisdiction on that ground.

Dawson vs. Columbia Ave., etc. Co., 197 U. S. 178.
Mercantile Trust & Deposit Co. vs. Columbus, 203. U. S. 198.

Whenever the want of jurisdiction becomes apparent in the progress of the cause, the bill should be dismissed.

Morris vs. Gilmer, 129 U. S. 315.

The Circuit Court therefore should have dismissed the bill, and was without jurisdiction to enter a further decree in the cause imposing terms and conditions upon the city as precedent to its right to have any relief.

It is respectfully submitted that the order and decree of the court below should be reversed, with direction to enter a final decree herein in favor of the city.

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